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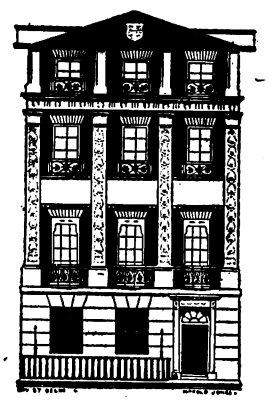

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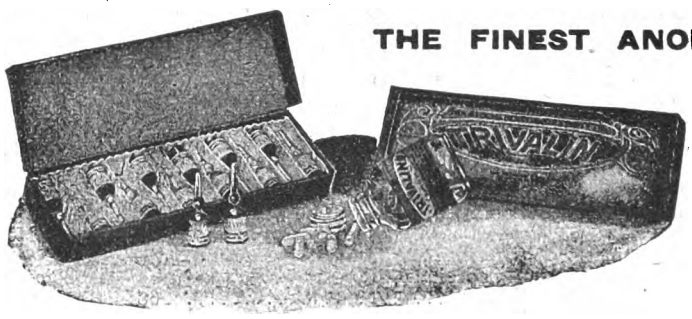

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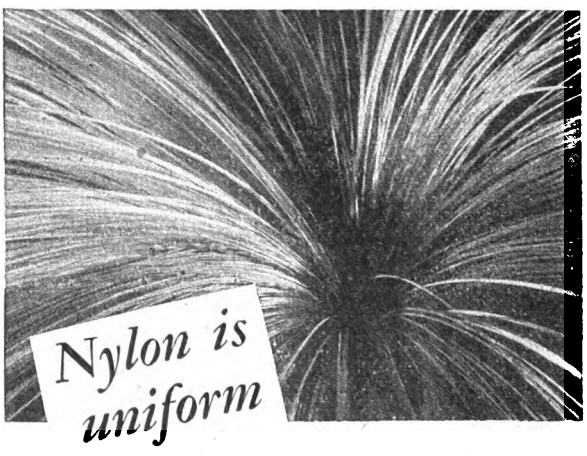

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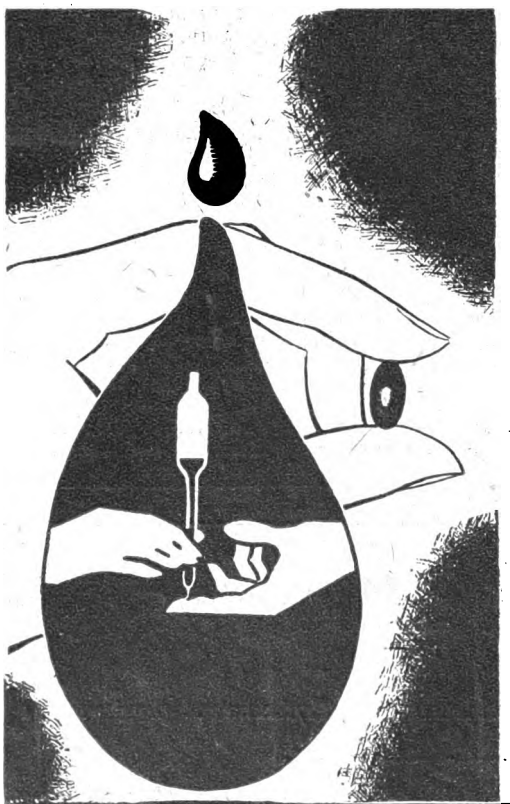

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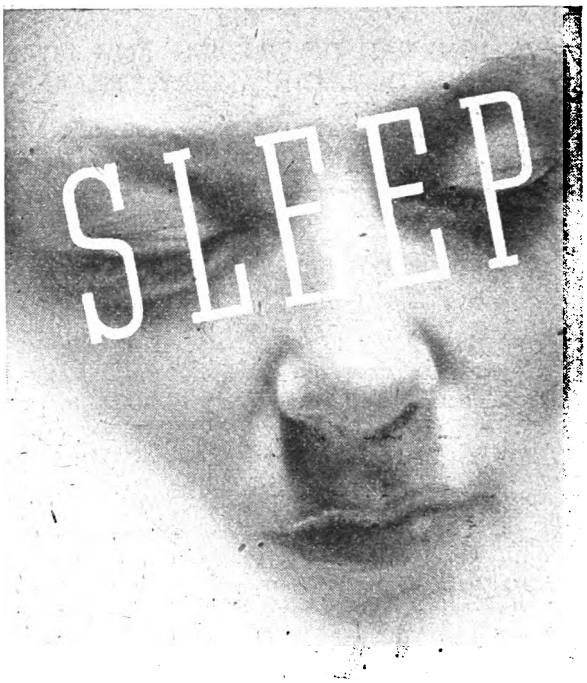

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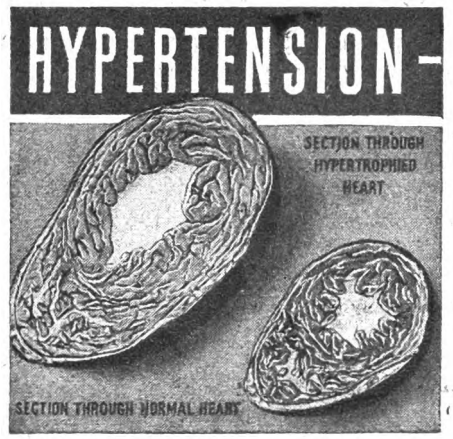

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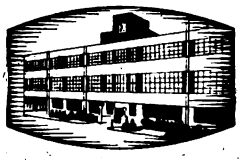

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OUT of evil can come good. War has always been a stimulus to progress in medical science. And so it may be profitable to review some war-time advances in a form of therapy which has indeed been a sheet-anchor to our wounded men, and consider how they may affect our peace-time work.

Following Landsteiner's discovery of the blood-groups,[22] the art of transfusion was not extensively practised until towards the end of the last war. Between the two great wars its possibilities were exploited in civil practice by those surgeons who had seen its value on the battle-field[14]; they passed from the arm-to-arm technique to the Kimpton tube, and so to the modern citrated-blood method, which permits ease of handling, as well as storage of the blood against an emergency. It is interesting to recall that blood storage was successfully carried out as long ago as the last war,[34] using a glucose-citrate diluent and with only the crude ice-boxes which were then available. The Spanish war brought the blood bank to the fore, and attempts to prolong the possible storage period were made by the Russians.[2]

In England, at the outbreak of war, the Medical Research Council had already organised a service of stored blood for the London area, while the Army Blood Transfusion Service, initiated by the Royal College of Surgeons soon after Munich, was in full operation within three days of war being declared. After Dunkirk the regional centres of the Emergency Medical Service came into being for the whole of the country.

The war has seen the development of blood substitutes, the perfection of blood-grouping (together with the discovery of new intra-group factors), an appreciation of the limitations as well as the virtues of transfusion, and great developments in technique. The subject has become highly specialised, demanding, for the best results, elaborate precautions and a facile technique which many have learned by reason of war but which is not acquired without considerable experience. In the British Army the policy of creating highly trained transfusion officers has paid handsome dividends. There is little doubt that a similar policy will be as necessary a part of any National Medical Service as the creation of health centres or the provision of facilities for routine radiological or pathological work. With the last the transfusion department might well be linked.

DEVELOPMENT OF THE BLOOD BANK

With the establishment of blood banks much early work was devoted to studying the changes which occur when blood is stored, and the measures which would retard deterioration.[3 9 27] Two main principles are universally acknowledged as indispensable: (1) a scrupulous technique in blood collection, and (2) the provision of immediate refrigeration, which, ideally, should be constantly maintained between 4° and 6° C until the blood is used. Refrigeration has been no easy problem for our armies in the field, especially when operating in tropical climates. But as the result of exhaustive tests apparatus[33] has been made available for the safe transport of blood from Cairo to Tripoli, from the United States to Europe; and a service from England to Burma is easily within the bounds of possibility. Much of this work is applicable to the supply of isolated places in time of peace. As to technical advances, the addition of glucose[3 28] to give a final concentration of 0·5–1·0% is now an essential routine practice, while the virtues of acidification, early recognised[3] but only recently exploited,[24] enable blood to be stored and used with safety as long as 28 days after collection.

These banks of stored blood have been of inestimable value for the emergency work of war, both at home and in the field; they have provided the ideal fluid, which has both oxygen-carrying and volume-restoring power, for the treatment of the exsanguinated. Stored blood finds its best use in this type of work and in the treatment of the simple anæmia of hæmorrhage; it is also extremely useful, when young, for preparing the red-cell concentrates[25] so convenient for the treatment of simple anæmias, especially those of hypoplastic refractory type.[41]

The blood bank is certainly a great convenience; but for peace-time work its limitations should be appreciated[42]: otherwise convenience may well outweigh therapeutic ideal. It is well known, for instance, that some portion of even very young stored blood is quickly destroyed when transfused[3]; the older the blood the more the destruction. And so, with a disease such as aplastic anæmia, where a transfusion life is necessary, there is much to be said for using fresh blood and obtaining the maximum survival. There is indeed quite a body of medical opinion[35 43] which strongly advocates the use of fresh blood for the majority of medical diseases, such as the blood dyscrasias, agranulocytosis, and the hæmorrhagic diseases, and certainly in septic conditions. This is only to be expected when it is realised that in stored blood leucocytes survive no more than a few hours,[36] platelets disintegrate,[20] and prothrombin disappears in a matter of days,[32] while complement[7] and immune bodies likewise deteriorate.

Prolongation of the storage period of blood refers to the red cells only, and not those other multiple ephemeral elements which have such a useful place in medical practice. But though stored blood is most appropriate for treating the exsanguinated, its transfusion carries a danger, particularly when the volume is large and the blood somewhat old. During the war we have learned that a man may lose 2 or 3 litres of blood or more and yet be brought back to life by prompt and adequate transfusion. With a blood loss of this order, oligæmic shock is certain; this combined with the noxious effects of tissue damage readily produces renal impairment. If several pints of somewhat old blood be transfused, the immediate effect may be excellent, but the kidney may be unable to deal with the pigment derived from that part of the transfusion which is inevitably hæmolysed. Oliguria or anuria may follow. The better thing to do is first to restore some circulatory efficiency with a blood substitute, and follow with only enough blood to support the operative and postoperative phases.

Blood banks require the most careful supervision[1 33]; they fully deserve the services of full-time officers. For though stored blood may be life-saving it may equally well be lethal, and he who relies simply on the date on a bottle as a criterion of fitness for use will soon be in trouble. It is essential to have a blood-bank officer to ensure skilled collection, proper refrigeration, and daily inspection and rejection of unfit bottles, and for technical matters such as checking the group, direct matching, and the preparation of red-cell concentrates. In busy times this last may be simply done by keeping bottles inverted in the refrigerator and transfusing no more than the lower half.

DEVELOPMENT OF BLOOD SUBSTITUTES

Much research has been devoted to the perfection of blood substitutes, which might transfer the load from the human donor to the animal world, the vegetable kingdom, or the realm of the synthetic chemist. Success has attended the production of fluids capable of restoring blood-volume, the vital requirement of the exsanguinated; but none possess oxygen-carrying power and so none can be regarded as complete substitutes for blood. Pectin,[16] isinglass,[37] and gelatin[31] have their virtues, but have not come into general use; nor has it been possible to process bovine plasma,[11 21] or serum sufficiently to guarantee freedom from reactions. German ingenuity has naturally turned to a synthetic product; their substance, periston,[17] is not much in advance of the gum-saline of the last war and has now been abandoned by themselves in favour of dried plasma.

The blood substitutes most widely used have been human plasma or human serum in fluid or dried form.[4 29] Great improvements have taken place in the making of the dried form by the development of the spin-freezing process[15 23]; this produces a fine crystal, reduces the drying time, and supplies a substance which is stable indefinitely even under tropical conditions and which reconstitutes rapidly. Dried plasma has been the mainstay of our armies fighting in places where blood is hard to obtain; stocks of it can be built up at leisure to

* Lecture delivered before the Society of Apothecaries of London on Dec. 19, 1944.

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provide a non-perishable reserve for any emergency, and it will doubtless find a place in post-war provision for the immediate treatment of road accidents, post-partum hæmorrhage, burns, and other emergencies where immediate restoration of blood-volume is needed to save life. One great advantage of such plasma is that no grouping test is required: another advantage is that plasma does not produce or precipitate any of the intra-group rhesus-factor complications, and so is particularly suitable for emergency maternity work; the obstetrician can carry it in his bag. Early assessment experiments[5] suggested that plasma was superior to serum, but clinical experience has shown that there is little to choose between the two.

A possible future development is a widespread use of purified human albumin solution,[6] which has been freely employed by the American Forces. It is carried in small bulk; it can be prepared equally well from fresh or aged plasma and even from cadaver blood,[13] and a by-product of its manufacture is one of the most potent anti-measles prophylactics in existence.

All these blood substitutes have their limitations. They are excellent for the acute phase of oligæmic shock, but when a large volume is required all surgeons have found that operation and the postoperative phase are less anxious if enough blood be administered to prevent the hæmoglobin being reduced below 70%. When blood is scarce, it should be conserved to supplement the blood substitutes in this way.

Protein nutrition has also been greatly studied,[26] and for this some of the blood substitutes, including plasma,[12] are available. America has paid much more attention to this side of preoperative and postoperative work than we have ourselves. Obviously it is as rational and as important to attend to protein requirements as it is to give the carbohydrate infusions which we have long practised; and none can doubt that recovery is impeded by the hypoproteinæmia so common in the under-nourished, who are always bad operation risks. This aspect is also of importance in the exsanguinated—especially abdominal cases who, in the postoperative phase, are starved and hydrated entirely by the intravenous route.

DEVELOPMENT OF BLOOD-GROUPING

The vast experience of war has taught us that blood-group determination is by no means simple; it demands a strict procedure, reagents of high quality, considerable experience, and an appreciation of all the phenomena which may intrude to obscure a simple reading of the result.[30] A single example will make this clear. On many occasions during the war I have been rung up from long distances by an agitated medical officer who has determined the group of his patient as AB, a universal recipient, but who has mercifully tried a direct test on the blood to be transfused and has found the recipient apparently incompatible with everybody, even with the universal donor group O. This paradoxical result, of course, immediately suggests the phenomenon of cold agglutination which demands special precautions for the performance of the test and when giving the transfusion. Knowledge on points such as this has become widely dispersed, but the result has been the delegation of blood-grouping to experts, now that the test is known to be less simple than was at one time believed.

The most spectacular advance, however, has been the separation and study of so-called intra-group factors, distinct from the Landsteiner groups; of these the most important are the rhesus factors.[38 45] The implications have been far-reaching. This discovery has influenced our outlook on multiple transfusions in pregnancy, and transfusions for any woman who has ever been pregnant, and it has led to measures for the prophylaxis and treatment of erythroblastosis neonatorum; also it has provided an explanation of the hereditary nature and the essential pathology of the last-named disease. We have always known that a transfusion carries a risk. But though it was long ago demonstrated that even group O corpuscles are antigenic[18] we have, for a quarter of a century, assumed that a donor once compatible would always afterwards be compatible with the same recipient. "Acquired" incompatibility has been reported from time to time,[47] but on the whole actual disaster from multiple transfusions has been rare. This is because the reaction is not usually fatal and is usually "inapparent" without dramatic symptoms, resulting in no more than a failure to hold the transfused blood—a disappointing transfusion. With modern methods[8] which study the fate of transfused blood many of these disappointments are now understood and can be avoided.

Destruction of the transfused blood not only from rhesus agglutinins but also, more rarely, from agglutinins for the subgroups of A and the factors M, N, and P, has to be considered in all cases of multiple transfusion; while at all times, particularly with massive transfusion, destruction, rapid or slow, by high-titre normal anti-A and anti-B agglutinins is a possibility. Considerable progress has been made towards isolating specific group factors with which dangerous agglutinins can be neutralised. With these group substances one can prepare so-called "conditioned blood"[46]—that is, blood in which all agglutinins have been neutralised—a matter of especial importance in the case of the widely used group O donor. Using such blood only corpuscular compatibility need be considered.

Performance of the necessary tests demands much skill and experience, and their proper interpretation in maternity cases involves a knowledge of the laws of heredity. Such work should be the province of a special transfusion officer at a regional centre where tests and advice can be obtained.

WAR-TIME AND PEACE-TIME TRANSFUSION WORK

Transfusion work in war is essentially of an emergency nature. All possible short cuts to eliminate error and lengthy procedures are necessarily employed. Only a fraction of peace-time practice falls into this category; much of the work is calculated and deliberate, with ample time and facilities for fine determinations. On the battlefield, for example, the only blood used is that obtained from the universal donor; homologous transfusion is not even contemplated, at least in forward areas. Yet homologous transfusion, with all compatibilities satisfied, provides the perfect tissue graft and is the therapeutic ideal in many medical diseases. In war the main requirement is restoration of blood-volume and the treatment of the simple anæmia of hæmorrhage. For this, stored blood is eminently suitable; but I have already indicated that fresh blood is far superior for much of our peace-time work. For such transfusion the direct method,[44] using a heparinised donor, is extremely convenient.

A peace-time panel of donors will need to contain those who, with due notice, are prepared to contribute to the bank or plasma pool, and those who, with relatively little notice, are prepared to be summoned to provide fresh blood.[49] Those who are contributing for plasma alone might well be rendered fit to give blood more frequently by reinfusion of their cells after donation.[39]

In war the commonest recipient is the fit young soldier whose cardiac musculature was in perfect order before his wounding. To him, large volumes need to be and can be administered at fast rate[19] without fear of overloading the circulation or producing pulmonary œdema. Indeed almost the only contra-indications[40] to enthusiastic transfusion in the wounded are injuries to the brain and central nervous system (in which little response is obtained), damage to the lung by blast, irritant gases or steam (which often causes pulmonary œdema), thoracic wounds where the circulation is mechanically impeded, and the onset of the fat embolism which may follow bone damage. In our peace-time patients, on the other hand, we have always to consider the state of the heart muscle,[10] the lungs, the blood-vessels, and essential organs, and from these findings the nature of the transfusion fluid, the amount to be administered, and the rate at which to give it, have to be carefully decided. In war one takes many a chance one cannot afford in peace.

DEMANDS OF PEACE AND WAR

Some idea of the demands of total war can be obtained from table I, which shows the growth of the Army Blood Transfusion Service throughout the war years.

These products have been exported to all our Forces, from Iceland to Madagascar and from England to Burma. This colossal effort could not have been accomplished unaided, and I take this opportunity of publicly acknowledging the generous assistance of the Medical Research

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TABLE I—GROWTH OF THE ABTS

	1939–40	1941	1942	1943	1944 *	Grand totals
Donors bled..	33,845	77,694	124,241	172,074	216,534	624,388
Blood export (pints) ..	3952	786	4035	4397	43,394	56,564
Plasma export (fluid) (pints)	8732	15,118	31,609	11,484	38,363	105,306
Plasma export (dried)(pints)	2249	17,090	29,569	95,768	126,228	270,904
Saline export (pints) ..	6598	23,997	59,790	324,777	288,123	703,285
Administration sets ..	55,502		47,438	115,830	134,168	352,938

* To Sept. 30.

TABLE II—SOURCES OF SUPPLY FOR ARMY
(Sept 3, 1939, to Sept. 30, 1944). (Figures in pints)

	Blood	Plasma		Totals
		(Fluid)	(Dried)	
ABTS	41,000	98,587	171,437	311,024
MRC, RN, and EMS ..	15,564	6719	25,504	47,787
Canada	—	—	73,963	73,963

In addition, the Medical Research Council drying plant, between March and October, 1943, dried 21,149 pints of plasma sent from the ABTS.

Council, the Emergency Medical Service, the Royal Naval Blood Transfusion Service, and the Dominion of Canada (table II).

General experience has shown that 10–15% of wounded men require to be transfused, and that the average casualty for whom transfusion is necessary requires about 4 pints of protein fluid. Table III gives a cross-section of the transfusion work during one of the heaviest stages of the fighting on the Continent :—

TABLE III—UTILISATION OF BLOOD AND OTHER PRODUCTS OVERSEAS
(June 6 to July 20, 1944)

Number of wounded	27,766
Amount of blood sent	13,000 pints
Blood used	11,500 pints
(Average daily : 287) = 41·4 pints per 100 wounded	
Plasma used	5734 pints
(Average daily : 191) = 20·5 pints per 100 wounded	
Saline used	6603 pints
(Average daily : 220) = 23·7 pints per 100 wounded	

The total consumption of our Forces on the Continent during the four months following D-day is shown in table IV.

TABLE IV—REQUIREMENTS FOR EUROPEAN OPERATIONS
(D Day to Sept. 30)

Blood	38,187 pints	Saline	71,240 pints
Fluid plasma ..	34,388 pints	Administration sets	57,697
Dried plasma ..	28,709 pints	Penicillin ..	15,722·63 m.u.

m.u. = mega units

Let us now turn from these massive war figures to the civilian requirements during the past few years. From these I have deliberately excluded those for 1940–41, when much was needed for air-raid casualties. The figures refer to a city of some 400,000 inhabitants with about 4000 hospital beds contained in the city itself and in the small towns within a 30-mile radius. About a third of the material has been used in maternity work :

	1942	*1943*	*1944 (Jan.–Sept.)*
Blood (pints) ..	3085	3877	3622
Plasma (pints) ..	2843	2149	2840
Rhesus tests ..	Nil	35	273

It will be seen that the annual requirements of this city have already reached some 4000 pints of blood and 3000 pints of plasma—the equivalent of some 12,000 donations. With increasing education in the virtues of transfusion these demands for material and special advice are likely to increase.

ORGANISATION REQUIRED FOR PEACE-TIME SERVICE

From what has been said, and from the figures I have been able to give, it will be clear that civil requirements have grown in parallel with war-time experience. The progress in technique, demanding both methods of precision and specialised knowledge, fully justify the continuation of regional transfusion centres with an advisory and executive medical officer whose primary (if not full-time) job is to maintain the high standard of transfusion work which has been of such inestimable benefit during war. He will need the assistance of a second medical officer for bleeding duties, and also two or three laboratory technicians for bacteriological and serological work, for apparatus assembly, autoclaving and other duties, which could with advantage include the preparation of crystalloid solutions for the region—a burden which the Army Transfusion Service has successfully shouldered for all the Fighting Forces. Three or four nurses would need to be provided for bleeding sessions, together with adequate transport, including a mobile refrigerator of sufficient capacity. A store with a competent storeman is also essential.

There can be little doubt that the preparation of dried plasma should be national and not regional, but regions should contribute to the national pool an amount of raw material at least equal to what they use.

The fundamental requirement of such a service is an adequate local donor panel which itself demands an appropriate secretarial department for registration, recording, calling up, as well as for publicity and enrolment. This department may well have the hardest task. During war the public, when properly approached, have given full support to all transfusion services; they have been eager, even anxious, to make this personal contribution to the war effort. Will they be like-minded when it comes to contributing to the needs of their fellow citizens? Will they appreciate the principle that it is as well to put something in the pot while you can, because you never know when you may want to take something out? Or will a donor's fee, optional perhaps, be necessary to maintain an adequate panel?

Before the war the basic donor panels were largely in the competent hands of the British Red Cross or Toc H. During the war these great organisations have also given much assistance. It may well be that they will continue to handle the problem afterwards. But one has to remember that the pre-war panel of the city for which I have given figures amounted to about 100; after the war this city will need to think in terms of 10,000 to 20,000. At the present moment, some 80,000 of its citizens are registered as donors. I have little doubt that if the case is clearly explained to them, a fair proportion will continue their good work for a time at least.

There is also the give-and-take method of maintaining a panel. Whenever a patient receives a transfusion his relatives or friends should contribute an equivalent amount to the bank.

* * *

A national transfusion service will undoubtedly be necessary after the war. Though it is but a small fraction of general medical requirements it should be included in all plans. Each and every region should now prepare an estimate of its needs and lay the foundation of this service before the stimulus of war has evaporated and the fine fabric which exists today has become disintegrated and dispersed.

REFERENCES

1. Army Medical Directorate (1942) *AMD Bull.* No. 14.
2. Bagdassarov, A. (1937) *Sang*, **11**, 466.
3. Bushby, S. R. M., Kekwick, A., Marriott, H. L., Whitby, L. E. H. (1940) *Lancet*, ii, 414.
4. — — — Whitby, L. E. H. (1942) *J. R. Army med. Cps*, **73**, 255.
5. Buttle, G. A. H., Kekwick, A., Schweitzer, A. (1940) *Lancet*, ii, 507.
6. Cohn, E. J. (1941) *Chem. Rev.* **28**, 395.
7. Crosbie, A. Scarborough, H. (1942) *Edinb. med. J.* **49**, 766.
8. Dacie, J. V., Mollison, P. L. (1943) *Lancet*, i, 550.
9. De Gowin, E. L., Harris, J. E., Plass, E. D., Swanson, L. W. (1940) *J. Amer. med. Ass.* **114**, 850.
10. Drummond, R. J. (1943) *Brit. med. J.* ii, 319.
11. Edwards, F. R. (1944) *Ibid*, i, 73.
12. Elman, R. (1942) *J. Amer. med. Ass.* **120**, 1176.
13. Erf, L. A. (1944) *Amer. J. med. Sci.* 207, 314.
14. Gordon-Taylor, G. (1922) Official History of the War. I, p. 108.

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BRACHIAL PAIN FROM HERNIATION OF CERVICAL INTERVERTEBRAL DISC

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RUPTURE of the intervertebral discs in the lower lumbar region is now well recognised as a cause—perhaps the main cause—of sciatica (Bradford and Spurling 1941, Symonds 1943). Clinical studies, controlled by operative findings, have resulted in the identification of this syndrome and its distinction from the hypothetical neuritis, fibrositis, myalgia, sacro-iliac strains and so on with which it had hitherto been confused (Love & Walsh 1938, Pennybacker 1940). It was only a matter of time before an attempt was made to determine what rôle, if any, was played by herniations at other levels of the spinal column.

It has long been known that herniation of the nucleus pulposus in the cervical region may produce compression of the spinal cord (Elsberg 1931, Peet and Echolls 1934, Stookey 1940) but it has recently been shown that a laterally placed herniation may compress a cervical root without involving the spinal cord (Semmes and Murphy 1943, Spurling and Scoville 1944). As in the legs, the syndrome so produced stands out in clear relief against the background of the other painful conditions of this region, which are variously attributed to neuritis, radiculitis, fibrositis and myalgia. In this article we report 8 cases of pain in the upper limb which are thought on clinical and radiological grounds to be due to postero-lateral herniation of the 6th cervical disc.

ANATOMY

In the cervical region the spinal cord is large and fills the canal moderately completely. Protrusion of an intervertebral disc may, if centrally placed, produce cord compression. Ruptures of the disc which are not to produce cord symptoms must be laterally placed and therefore project into the intervertebral foramen, where quite small protrusions can produce pressure on nerve-roots.

There are eight cervical nerves and only seven cervical discs—the first nerve leaving the canal between occiput and atlas where there is no disc. Herniation of a disc at any cervical level will press on the next numbered nerve—i.e., the 7th cervical root is compressed by the 6th disc, lying between the 6th and 7th cervical vertebræ. In the thoracic and lumbar regions the nerve-roots correspond numerically with the disc opposite to which they emerge. Cervical roots differ from lumbar roots in their transverse course, each running over one disc only, whereas in the lumbar region they run longitudinally and several pass over each lumbar disc. If, therefore, symptoms occur in more than one cervical root distribution then there must either be rupture of more than one disc or an irradiation from one segment to another.

CASE-RECORDS

CASE 1.—Male, aged 38. While lifting a small hammer he felt a sudden sharp pain to the left of the 7th cervical spine, spreading in three days towards the back of the left shoulder, down the back of the arm and dorsum of the forearm to the wrist, and, to a lesser degree, to the upper pectoral region. It was aggravated by coughing, bending the head to the left, stooping and massage. There were paræsthesiæ in the thumb and distal phalanx of the index.

On examination: Lateral flexion of the head to the left and extension of the neck produced pain down the left arm. Head traction gave no relief and pressure on the head did not produce pain. There was no tenderness of the cervical spine, but on the left side the trapezius, triceps and extensors of the wrist and fingers were moderately tender; there was flabbiness of the triceps and slight weakness of the whole limb, apparently due to fear of pain; definite blunting to pinprick and light touch over the dorsum of the index finger, proximal phalanx of the thumb and first interosseus space. The right triceps jerk was barely perceptible, the left brisk, and the other tendon reflexes brisk and equal on the two sides. Cerebrospinal fluid (CSF) normal. X rays of cervical spine normal. 'Pantopaque' myelogram showed a filling defect opposite the 6th disc on the left, with non-filling of the sheath of the 7th root (fig. 1*a*). He improved with rest and wearing the arm in a sling.

Comment: The clinical features indicated a lesion of the 7th root. This was confirmed by the X-ray findings.

CASE 2.—Male, aged 38. Three weeks' history of pain in neck, back of right shoulder and down right arm. He was quite fit until the abrupt onset of severe stabbing pain just to the right of the mid-dorsal spine while undergoing forcible neck flexion during PT. Continuous gnawing pain persisted, aggravated by stooping, coughing and lying on the side. Next day he experienced sudden pain down the back of the right arm, lateral aspect of elbow, and posterolateral border of the forearm on to the back of the wrist. Movement of the arm and coughing caused pain down the limb. He noticed a dull gnawing discomfort in the anterior and posterior folds of the right axilla, coming on chiefly when straining. Over the same period he was aware of numbness in the tips of the right thumb and 1st and 2nd fingers: no pins and needles; pain and numbness aggravated by turning head to left. The right arm felt heavy and weak.

On examination: Slight limitation of all neck movements. Rotation of head to the left produced pain in arm. Lateral inclination of head to right shoulder caused pain in right arm and neck. He was tender to percussion over lower cervical vertebræ and very tender over upper part of right trapezius, extending to the shoulder. Tender over right triceps, radial groove and dorsum of forearm; definite flabbiness of triceps and some wasting of upper fibres of pectoralis major. Power markedly diminished in right triceps and extensors of wrist; to a lesser extent in flexors of fingers. Some of this weakness was due to pain. Hypo-algesia and hypo-æsthesia over small area on dorsum of right hand, over 1st interosseus space and proximal portion of index finger. Triceps jerk absent on right, reflexes otherwise normal. CSF normal. Blood Wassermann reaction (WR) negative. X ray of neck normal. Pantopaque myelogram showed filling defect between C 6 and 7 on right side, with non-filling of the sheath of 7th cervical root (fig. 1*b*).

He improved slowly after 7 weeks off work.

CASE 3.—Male, aged 40. Awoke one morning with a slight gnawing pain on the tip of the left shoulder which became steadily worse and 7 days later began to spread over the shoulder and along outer aspect of the upper arm. Two weeks later the pain had spread along radial border of the forearm to the wrist. This pain was almost continuous, but 6 weeks after onset he developed an additional stabbing pain which passed down the left arm to the knuckles of the 2nd

SIR LIONEL WHITBY: REFERENCES (*continued*)

15. Greaves, R. I. N. (1942) *J. Hyg., Camb.* **41**, 489.
16. Hartman, F. W., Schelling, V., Harkins, H. N., Brush, B. (1941) *Ann. Surg.* **114**, 212.
17. Hecht and Weese, (1943) *Münch. med. Wschr.* p. 11.
18. Hooker, S. B., Anderson, L. M. (1921) *J. Immunol.* **6**, 419.
19. Kekwick, A., Maycock, W. d'A., Marriott, H. L., Whitby, L. E. H. (1941) *Lancet*, i, 99.
20. Kolmer, J. A. (1939) *Amer. J. med. Sci.* **197**, 442.
21. Kromen, A. J. (1942) *Surgery*, **11**, 333.
22. Landsteiner, K. (1900) *Wien. klin. Wschr.* **14**, 1132.
23. Lanyon, E. C. G. (1941) *J. Hyg., Camb.* **41**, 111.
24. Loutit, J. F., Mollison, P. L., Young, I. M. (1943) *Quart. J. exp. Physiol.* **32**, 183.
25. MacQualde, D. H. G., Mollison, P. L. (1940) *Brit. med. J.* ii, 555.
26. Madden, S. C., Carter, J. R., Kattus, A. A., Miller, L. I., Whipple, G. H. (1943) *J. exp. Med.* **77**, 277.
27. Maizels, M., Whittaker, N. (1940) *Lancet*, i, 540.
28. — (1941) *Ibid*, i, 723.
29. — (1944) *Ibid*, ii, 205.
30. Medical Research Council (1943) War Memo No. 9.
31. Parkins, W. N., Koop, C. E., Riegel, C., Vars, H. M., Lockwood, J. S. (1943) *Ann. Surg.* **118**, 193.
32. Quick, A. J. (1940) *J. Amer. med. Ass.* **114**, 1342.
33. Resuscitation (1944). War Office, London.
34. Robertson, O. H. (1919) *Spec. Rep. Ser. med. Res. Coun., Lond.* No. 25.
35. Smith, J. (1942) *Med. J. Aust.* ii, 92.
36. Stewart, C. P. (1940) *Edin. med. J.* **47**, 441.
37. Taylor, N. B., Waters, E. T. (1941) *Canad. med. Ass. J.* **44**, 547.
38. Taylor, G. L., Race, R. R. (1944) *Brit. med. Bull.* **2**, 160.
39. Tui, C., Bartter, F. C., Wright, A. M., Holt, R. B. (1944) *J. Amer. med Ass.* **124**, 331.
40. War Office (1944) Field Surgery Pocket Book, London.
41. Watson, L. (1943) *Lancet*, i, 107.
42. Whitby, L. E. H. (1941) *Proc. R. Soc. Med.* **34**, 257.
43. — (1942) *Lancet*, i, 581.
44. — Britton, C. J. C. (1944) Disorders of the Blood, London, p. 491.
45. Wiener, A. S. (1943) Blood Groups and Blood Transfusion, Baltimore.
46. — Pennell, S. S. (1942) *Amer. J. med. Sci.* **204**, 1.
47. Wolfe, J. J., Gupta, C. E. D. (1941) *Brit. med. J.* ii, 807.

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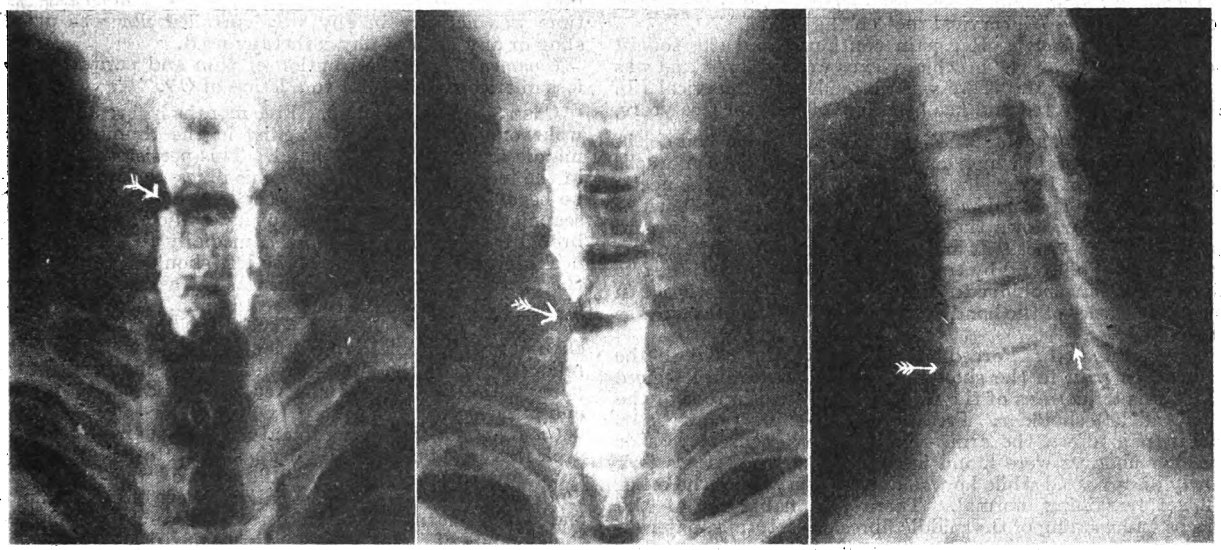

(a) (b) (c)

Fig. 1—(a) Case 1: the column of pantopaque shows a filling defect opposite the 6th disc with non-filling of the root-sheath. (b) Case 2: the pantopaque column is interrupted opposite the 6th disc with non-filling of the root-sheath. (c) Case 4: oblique view showing narrowing of the 6th disc with anterior lipping and side-to-side narrowing of the intervertebral foramen.

and 3rd metacarpals. It was 10 days before he realised that this sharp pain was produced by inclining his head to the left and that it could be eased by putting his head to the right or well down between his knees. Seven weeks after onset he first noticed paræsthesiæ, consisting of a severe tingling on both surfaces of the index, middle and ring fingers. At this time jolting was very painful. An attempt at intermittent head traction was made and he was suspended by the head for 60 seconds. This gave complete relief during the suspension but on being let down again he was very much worse and after the ninth suspension his pain became so bad that he was confined to bed. He found that in bed he could sleep only on his back at an angle of 30° and the pillows had to be arranged to prevent him from slipping. He was seen by us 3 months after onset; the pain was improving but was still severe.

On examination: Carried head a little over to the right. There was slight tenderness over the spines of C 6 and 7 and also just to the left of this area. There was limitation of left lateral flexion because this produced pain. There was definite wasting and flabbiness of the left triceps and extensors of wrist. There was weakness of the left triceps and slight weakness of the extensors of the left wrist and fingers. No sensory loss. Left triceps jerk was absent, other reflexes being brisk. CSF was normal in all respects. X ray showed a well-marked loss of the intervertebral space between the 6th and 7th cervical vertebræ. There was marginal lipping which extended laterally and posteriorly to encroach on the vertebral foramen. Pantopaque myelography showed non-filling of the left 7th cervical nerve-root sheath with good filling at other levels.

This patient was treated by rest until the pain cleared up and 5 months after onset he was pain free. The left triceps jerk was still absent at this time.

Comment: Clinically a lesion of the left 7th cervical root, confirmed by myelography. Spontaneous remission.

CASE 4.—Male, aged 34. While playing rugby in late 1942 he was handed off by a blow on the left side of the neck. Two days later he developed a pain above the left scapular spine which in a few days radiated across the posterior axillary fold and down the outer aspect of the left upper arm and along the radial border of the forearm to the index and thumb knuckles. This was a dull continuous ache on which were superimposed momentary stabs, throughout the painful area. A fortnight after the onset he developed a sensation like a severe electric current deep in the upper arm and along the lateral aspect of the forearm to the thumb and index. This was intermittent and could be produced by bending the head forward and to the left. A diagnosis of brachial neuritis was made and he was treated with physiotherapy. The condition varied in intensity and was made worse by jolting, as when running or being in a bumpy car. In August, 1943, his neck was manipulated without anæsthesia and all his symptoms increased. There was now involvement of the right arm with radiation of pain and paræsthesiæ into the thumb, index and middle fingers of the right hand. This attack lasted 2 months. Pain was increased by a lumbar puncture. The spinal fluid was normal in all respects. From October, 1943, he had several sharp attacks of pain and paræsthesiæ lasting for a week each, particularly after physical effort. He was admitted to this hospital in April, 1944, because of a severe attack of pain and tenderness in the upper part of the left trapezius. He also had pain in both arms running into the thumbs and outer fingers.

On examination: Very slight limitation of left lateral flexion of cervical spine, with no tenderness. The left triceps was flabby and a little weak and there was slight weakness of the extensors of the left wrist. The left triceps jerk was lost. There was no constant sensory abnormality on repeated examination. The rest of the central nervous system was normal. Paræsthesiæ could be produced in the left index and middle fingers by forcible lateral flexion of the head to the left. There was no evidence of costoclavicular compression. X ray showed loss of normal lordosis with almost complete disappearance of the intervertebral disc between the 6th and 7th cervical vertebræ. Gross marginal lipping was present with a little forward angulation. In oblique views the marginal lipping was seen to encroach upon the intervertebral foramina on either side (fig. 1c).

This patient was given a leather collar and there have been no further acute episodes though the chronic pain and paræsthesiæ are still present.

Comment: A lesion of the 7th cervical root on each side with radiological evidence of side-to-side narrowing of the intervertebral foramen.

CASE 5.—Female, aged 36. Abrupt onset of pain in lower part of neck and between the scapulæ while making a bed, passing next day from root of neck down outer aspect of right arm and forearm to the radial border of the wrist. She located the pain especially in the outer surface of the elbow, just below the head of radius, and it was associated with paræsthesiæ in the index and middle fingers. Pain aggravated by coughing, stooping and turning head to right. This persisted for 5 weeks and appeared to be aggravated by cold, movements of the arm and jolting the spine.

On examination: Neck movements were very free except for lateral inclination of head to right shoulder, which produced pain down arm and in neck. She was tender over the lower cervical vertebræ and very tender over the upper free edge of the trapezius and subjacent muscles, as judged by needling. There was tenderness over the triceps and extensors of forearm and slight hypalgesia over the distal phalanges of the index finger. No weakness or wasting. The triceps jerk was absent on the right but all other reflexes were normal. CSF normal and WR negative. X ray of cervical spine showed narrowing of 6th cervical disc.

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Comment: The clinical and radiological evidence pointed to a lesion of the 7th cervical root on the right.

Subsequent history: Her pain continued and she sought advice elsewhere. The brachial plexus was explored and was found to be normal; there was no evidence of cervical rib. She slowly recovered and has been free of pain for two years.

CASE 6.—Male, aged 42. Eighteen years ago he had a stiff neck of abrupt onset which lasted for a fortnight. Ten weeks before admission he developed a painful stiffness of the neck; this became severe, and pain spread laterally to the back of the left shoulder, down the outer aspect of the left arm and forearm to the wrist. It was aggravated by using the left hand, by coughing and by turning the head to the left. If he allowed the left shoulder to sag he developed paræsthesiæ in the ulnar border of the hand and little finger, but the pain was unaffected.

On examination: Forced movements of the head to the left caused pain in the shoulder and upper pectoral region. There was tenderness of the muscles between the root of the neck and left shoulder. Pressure in the supraspinous fossa caused pain down the arm. No weakness, sensory loss or vascular changes were found in the hand. The triceps jerk slowly disappeared while he was under observation, the other reflexes remaining normal. There was flabbiness of the triceps and wasting of the middle fibres of pectoralis major on the left. X ray showed narrowing of the 6th cervical disc and a unilateral rudimentary cervical rib in the left. This was thought to explain the paræsthesiæ in the distribution of T1, when the shoulder sagged. Electromyogram showed no evidence of denervation in the muscles of the limb, but there was increased irritability in the tender muscles, and sustained discharge of action potentials at the trigger areas in the muscles of the shoulder girdle. Injection of procaine into these areas stopped this spasm and gave him partial relief from pain.

Comment: The distribution of pain in the limb, and the disappearance of the triceps jerk, indicated a lesion of C7. The narrowing of the 6th disc was compatible with a herniation at this level.

CASE 7.—Male, aged 36. (This patient is a doctor and the description is given in his own words.) Woke with pain in the right side of the neck, spreading to the shoulder tip. During the day the pain spread down the back of the shoulder into the dorsum of the right forearm. During the next few days this pain increased in severity and a dull ache began in the extensors of the fingers. There was a little weakness of finger movements at this time but no reflex change. After a week the pain subsided and tingling started on the palmar surface of the right hand. It began in the thumb and spread to the first two fingers. Later it involved the radial half of the palm and spread up the outer side of the forearm about halfway to the elbow. It was variable and increased over a week. During this time the triceps jerk became sluggish and there was definite weakness of triceps. The symptoms were worse at night and sleep was considerably interrupted by dull aching pain in the muscles as above and by paræsthesiæ. There was no demonstrable sensory loss, but subjectively there was obvious over-action to pain and light touch in the area of paræsthesiæ. It was found that movement of the neck would intensify the sensory symptoms, but it was very difficult to analyse which movement was responsible alone. After 3 weeks the triceps jerk disappeared. There was no increase in weakness.

Full neurological examination on two occasions showed no other defect. At this time, sustained pressure on the head increased the pain in the neck, shoulder and arm, and caused an exacerbation of the paræsthesiæ. Each time there was a definite delay of at least 5 seconds before the onset of the results of the test. Because of this, manœuvres of the neck were performed with a period of waiting afterwards and it became apparent that the only position which induced symptoms was that of flexion of the neck to the right with moderate extension, particularly with the chin well forward (as in looking at an aeroplane in the left visual field). This, after about 5 seconds, induced so much pain and such uncomfortable paræsthesiæ that it could not be maintained for more than about 10 seconds. In consequence an extra pillow was used, the idea being to keep the neck flexed to the left. This resulted in gradual improvement and there was no disturbance caused by paræsthesiæ during the night.

Improvement began about eight weeks after the onset, but whether it was spontaneous or resulted from the extra pillow is not known. Improvement was steady and appears now to be complete. X ray of neck was normal. At no time was activity in any way curtailed nor was a splint, sling or any form of physiotherapy used.

Comment: The distribution of pain and paræsthesiæ and loss of triceps jerk point to a lesion of C7.

CASE 8.—Male, aged 46. Five months before admission he woke one morning with tingling in the thumb, index and middle fingers of the left hand. This persisted, particularly in the index finger, throughout his illness. A fortnight later he began to have pain behind the left shoulder in the supra-scapular region. Physiotherapy and injections of procaine brought no relief. Pain spread medially to the root of the neck, laterally to the tip of the left shoulder, down back of the arm and dorsum of forearm as far as the knuckles. It also spread to the upper pectoral region. The left shoulder was raised and the head fixed with inclination towards the shoulder. Manipulation of the neck under 'Pentothal' relieved him of the stiffness and pain in the neck, but the pain in the arm was unaffected. His incapacity persisted and interfered with sleep.

On examination he was found to have slight limitation of neck movements, especially flexion and rotation to the right, but forward flexion was full. There was considerable tenderness in the levator scapulæ, upper fibres of trapezius and supraspinatus, with weakness. Blunting to pinpricks on the dorsum of index finger. Reflexes brisk. CSF normal and WR negative. X ray showed narrowing of 5th and 6th cervical discs. Electromyogram showed no evidence of denervation but spontaneous motor activity in the tender muscles of the shoulder girdle, arm and forearm.

Comment: The distribution of pain and paræsthesiæ suggests a lesion of the 7th root. X rays confirm the presence of an abnormality of the appropriate intervertebral disc.

ANALYSIS OF CLINICAL FINDINGS

Symptoms and signs fall into two groups—those which are irritative or excitatory, such as pain, paræsthesiæ and muscle spasm, and those which are paralytic or inhibitory, such as weakness, wasting, sensory loss and reflex changes.

The common complaint is of pain, usually with paræsthesiæ. Rarely does the patient come for numbness or weakness. The pain is of a dull gnawing character, often compared to toothache. It usually begins behind the shoulder girdle in the supraspinatus area and spreads at varying rates (usually taking days) over the outer aspect of the shoulder and posterior axillary fold, along the outer aspect of the upper arm to the elbow, and then along the radial border of the forearm to the wrist. It is common for the pain to stop at the wrist, but it may go into the index and middle knuckles. Patients may complain of "pain" in the finger tips but on careful inquiry it is usually found that by pain the patient means unpleasant paræsthesiæ in the more distal parts. The pain may take some days to a week or two to spread from the shoulders to the wrist. Superimposed on the background of a dull ache there is almost invariably a much sharper pain which radiates rapidly through the whole distribution and is commonly described as a stab or electric shock. This shock extends into the index finger and may spread to the thumb and middle fingers.

Aggravating factors.—Neck movements are variable in effect. In most cases flexion of the head to the side of the lesion produces or aggravates the pain. This may not happen at once but requires an interval of seconds or even minutes and presumably acts by squeezing the herniation against the nerve. Very rarely flexion away from the lesion produces pain. This is usually immediate and we believe occurs when the root is adherent to the disc and is vigorously stretched across it. Jolting of the body, as in a car, often aggravates the pain and may produce paræsthesiæ, whereas jarring of the spine rarely has any effect. Straining, sneezing and coughing will in the acute stages produce a shoot of pain in the usual distribution. Using the arm in certain postures will produce pain and paræsthesiæ—e.g., holding the arms outstretched as when playing the piano or pushing a lawn mower. Each patient will by experience find some posture of the arm which is a specific aggravating factor.

Lumbar puncture may produce a sharp attack of pain. Manipulation is potentially a dangerous procedure which might conceivably precipitate cord compression and may start off a full-blown attack with increase of

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pain and paræsthesiæ. If a general anæsthetic is used for the manipulation of a case with much muscle spasm, then the relaxation of the spasm by the anæsthetic will relieve pain and this relief may be wrongly attributed to the manipulation.

The position in bed at night is very important, for unless the pillows are carefully arranged it is extremely easy for the head to slip into a posture that would be avoided in waking hours. This is sometimes the cause of the pain and paræsthesiæ which awaken patients and may make continuous sleep impossible.

Relieving factors.—The posture of the cervical spine is the most important factor. Every patient finds after a week or two which position gives him the greatest relief, and once this is determined he will try to keep his head in that position until the condition clears up. The common relieving movement is lateral flexion of the head away from the lesion. An element of flexion or extension may have to be introduced but this is variable. Putting the head down between the knees will sometimes ease the pain. Mechanical traction by head harness will ease the pain while traction is maintained. As already mentioned, posture in bed is important; lying flat or almost flat is not good, and in at least two of our cases the turning point towards recovery seemed to come when an extra pillow was used and the patient was sitting up more than usual. An angle of 30–40° seems best. Fixation of the neck as by a leather collar produces relief so long as the collar is worn.

Paræsthesiæ.—Like pain, paræsthesiæ are in these cases a result of irritation of a nerve-root. They are variable in nature, being described as tingling, pins and needles, a sense of vibration, electric currents, or a dead feeling. They may be mistaken for pain and indeed are sometimes so unpleasant that they may form the patient's major complaint. Their general distribution is much the same as that of the pain but differs in that they are maximal at the periphery. Invariably the index finger is affected, with frequent spread into the thumb and middle fingers. Paræsthesiæ, if not spontaneous, may be produced by any of the manœuvres which aggravate the pain and also by pressure on tender points in muscles. Like the pain it is unusual for the paræsthesiæ to begin until two or three minutes after the aggravating stimulus is applied. Our cases have not shown any gross vascular changes, nor has there been any suggestion of compression of the limb vessels in the costoclavicular space. It is unlikely that the paræsthesiæ are vascular in origin. In one case there has been spread of paræsthesiæ into the inner fingers. Spurling and Scoville (1944) suggest that this is not uncommon and is due to a secondary spasm of the scalene muscles producing a scalenus anterior syndrome. This was seen in case 6, in whom there was a rudimentary cervical rib on the affected side. We feel, however, that generally speaking the spread of paræsthesiæ, and the wide distribution of pain and tenderness in muscles on either side of the seventh cervical area, are due to wide overlap of cervical segments and the spread of an excitatory process in the spinal cord.

Tenderness is usually deeply situated in the upper fibres of trapezius, levator scapulæ, upper fibres of pectoralis major, triceps, and along the extensor muscles on the dorsum of the forearm. It varies in degree from slight to severe, with points of special intensity in the trapezius and subjacent muscles. Pressure on such "trigger" areas may cause pain to shoot down the arm with or without exacerbation of the paræsthesiæ. Infiltration of these trigger points with procaine will sometimes relieve the patient's symptoms, a fact which has led to an incorrect diagnosis of fibrositis in some cases. Hyperalgesia of the skin was present in only one case.

Wasting, weakness, sensory loss and reflex changes are paralytic or inhibitory phenomena and when present have a narrow, sharply defined and more constant distribution than the excitatory phenomena. This narrow distribution is due to the segmental overlap which is so marked in the cervical roots and we feel that this is strong evidence in favour of the uniradicular nature of the syndrome. Weakness of the triceps and extensors of the wrist may occur, but it is not always possible to know how much of this is due to interference with the nerve supply and how much to the pain. Flabbiness of the triceps is common, and there may be wasting of the triceps, extensor region of the forearm, and sternal fibres of the pectoralis major. In lesions of the 6th cervical disc, involving the 7th root, the triceps jerk is often reduced or absent, but it varies from time to time in individual cases and is conserved in the early stages of the condition. The biceps and supinator jerks are unaffected.

Sensory loss is never complete and usually consists of a minor degree of hypo-algesia and hypo-æsthesia. This involves both surfaces of the index finger and may include the middle finger and terminal phalanx of the thumb. It usually misses the dorsal surface of the first interosseus space, but may spread to the radial border of the wrist and distal third of the forearm (see fig. 2). We have found no loss of deep sensibility.

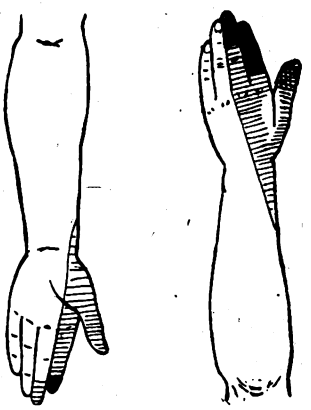

Fig. 2—Distribution of hypo-æsthesia and hypo-algesia in lesions of 7th cervical root attributed to prolapsed disc. The frequency with which these changes are found is indicated by the density of the shading.

GENERAL NEUROLOGICAL AND SPECIAL EXAMINATIONS

The laterally placed herniations do not compress the spinal cord and there is a corresponding absence of abnormal neurological signs in the trunk and lower limbs. The cerebrospinal fluid has been normal in the cases reported here and the Queckenstedt test showed no evidence of block.

Electromyograph studies.—On testing the affected muscles with the electromyogram, there was no evidence of denervation—i.e., no fibrillation action potentials (Weddell et al. 1943)—but the tender muscles showed a consistent increase of irritability, while in two cases with "trigger" areas in the muscles of the shoulder girdle there was continuous and apparently involuntary spasm of small groups of muscle-fibres at the sites of maximum tenderness. This spasm was removed by procaine injected at the seat of the discharge. The relief of pain which followed this procedure is thought to mean that the spasm induced by the painful lesion of the nerve-root formed a secondary source of pain.

Cervical spine.—Clinical examination of the spine shows remarkably little abnormality. Only in the acute phases is there much limitation of movement. This is usually protective to prevent lateral flexion or rotation to the side of the lesion. Pressure on the head from above usually produces pain or paræsthesiæ in the distribution described.

Clinical tests.—These consist of attempting to squeeze the nerve against the pedicle or lamina by narrowing the already narrowed intervertebral foramen. Spurling's "neck-compression test" is the best manœuvre and is carried out by exerting a steady downward pressure on the forehead from behind while the head is tilted towards the lesion. Pain and paræsthesiæ are produced but it is important to remember the delay in onset of symptoms and also that the test is positive only in the active phase of the condition.

X rays may be normal. There may be a reduction of the normal cervical lordosis, narrowing of the 6th cervical disc, narrowing with sclerosis of the margins of the adjacent vertebræ, narrowing with anterior lipping, and narrowing with lipping in the region of the intervertebral foramen. This last is probably important inasmuch as the foramen is narrower from side to side than from above down, and any further reduction of its width by a protrusion of the disc will compress the emerging root (case 4). Lipping in this situation is best seen in oblique views. Changes such as these are however at most suggestive. They are common in people without symptoms. More accurate information is derived from contrast myelography. Pantopaque is used for this purpose because its fluidity, unlike 'Lipiodol,' enables it constantly to fill small spaces like the dural sleeve and it can be removed by a lumbar puncture needle relatively easily when the examination is complete. In the three

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cases in which this was done a filling defect was demonstrated opposite the 6th cervical disc on the affected side and—more important—the dural sleeve surrounding the root did not fill, in contrast to the good filling of the unaffected roots above and below. This obliteration of the root sac confirms the presence of a pathological process, and in conjunction with a filling defect or notch in the column of pantopaque suggests that the non-filling is due to a herniation of the disc at that level. These radiological findings were identical with those of Spurling and Scoville (1944), in cases of operatively verified herniations.

TREATMENT

Treatment is essentially conservative. In none of our cases was surgery considered necessary. The important factor is rest to the neck. This is done automatically by the patient when he fixes the head in the easiest position. If pain is very acute then rest in bed with careful adjustment of the pillows is necessary and effective doses of the simpler analgesics should be used. In every case, whether confined to bed or not, a review of the sleep position must be made and the most suitable height of pillows found by trial. According to Spurling and Scoville continuous head traction by a harness using 10–12 lb. weight will relieve pain in any case and the majority will remain symptom-free after 3–5 weeks. None of our cases has been severe enough to require this. As a lesser or continuation measure a well-fitting leather collar worn during the day will suffice. If these measures fail after adequate trial then surgery may be tried (Spurling and Scoville 1944, Semmes and Murphy 1943).

DISCUSSION

Trauma is not an essential precursor of the syndrome and even when present it may be no more severe than the minor traumata which may happen to anyone. Sometimes however there is a specific blow or twist which may precede the symptoms so closely that it is impossible to ignore it. Occasionally there is a history of cricks in the neck for months or even years before pain begins but these cricks differ in no way from those occurring in patients in whom no subsequent symptoms develop. It therefore seems necessary to invoke a degenerative as well as a traumatic factor.

It is thought that degenerative changes in the nucleus pulposis precede herniation in those cases which start with either slight trauma or no trauma at all. The nuclear material found at operation is usually softer and less elastic than normal, and may spontaneously exude when the annulus is incised. Haglund (1942), describing autopsy studies on posterior, posterolateral and lateral herniations in the cervical region, shows how the nuclear material pushes aside the surrounding laminæ of the annulus in tracking towards the periphery, and demonstrates compression of cervical roots, together with a case of kinking of the vertebral artery by a lateral protrusion. He quotes Jonsson's (1939) findings in support of the degenerative nature of the process underlying prolapse. It is our present view that if the annulus holds firm the nuclear material may herniate into the body of the vertebra above or below, producing a Schmorl's node. But if the annulus is weakened by degeneration or by the presence of a congenital defect, a comparatively minor trauma will force the swollen nucleus through it. This is admittedly an entirely theoretical conception, which arises from the frequent association of Schmorl's nodes and posterolateral herniations in the same subject, and from the trivial nature of the trauma in many cases. In the lumbar region the mechanism is thought to be exactly the same. The greater frequency of ruptured lumbar discs is probably due to their having to take the body-weight and their chances of trauma being greater.

The clinical picture presented by these cases stands out in clear-cut contrast to the other forms of pain in the upper limb with which they have hitherto been confused. Root symptoms occurring in the presence of radiological evidence of cervical spondylitis osteoarthritica have long been recognised (Hanflig 1936, Turner and Oppenheimer 1936) but without the realisation that the symptoms were due to the involvement of a single root by a herniation of the disc. In the absence of radiological changes they have been attributed to a primary "radiculitis" or "brachial neuritis." When associated with well-marked tenderness of the muscles of the shoulder girdle they are commonly regarded as fibrositic, and any paræsthesiæ or objective neurological changes were attributed to a spread of the fibrositis to involve the nerves of the brachial plexus. The presence of trigger areas, which when pressed on give rise to pain in the arm, is often accepted as confirming the presence of fibrositis, and, if infiltration of the tender areas with procaine relieves the pain, proof is regarded as complete (Steindler and Luck 1938). It has been pointed out elsewhere (Elliott 1944) that such trigger areas occur in the presence of root lesions, and that relief from procaine does not exclude such a lesion. Fibrositis is a hypothetical entity, without known pathology, but if it does occur it is difficult to imagine how any such process could spread from the muscles of the shoulder girdle through the cervical fascia to involve a single root. The implication of a prolapsed disc, on the other hand, not only explains the combination of unequivocal motor, reflex and sensory signs on a uniradicular basis, but also brings this form of brachial pain into line with the better established condition of radicular sciatica.

Diagnosis in these cases was based on the clinical picture and confirmed by the use of pantopaque myelography in three cases. Surgical verification was not obtained because the natural course of the condition is towards spontaneous recovery.[1] It is felt that surgery should be reserved for recurrent severe cases—a view shared by Spurling and Scoville. They describe herniations of the 5th cervical disc pressing on the 6th root, and although none have been encountered in this series it is thought that Semmes and Murphy's expectation of lesions at this and other levels is likely to be realised now that attention has been drawn to the possibility.

SUMMARY

Eight cases of brachial pain are described.

They showed a uniform distribution of pain in the back of the shoulder, down the back of the arm and the radial border of the forearm, and sometimes in the upper pectoral region. There were paræsthesiæ in the thumb, index and middle fingers. In some cases there was a history of acute stiff neck.

The signs included limitation of movement of the neck; pain produced in the arm by movements of the neck and by downward pressure on the head; and tenderness, weakness, and wasting of the upper fibres of pectoralis major, triceps and extensors of the wrist and fingers. The triceps jerk was reduced or absent, and there was usually hypo-algesia on the thumb and index finger.

The clinical picture was that of a lesion of the 7th cervical root.

Contrast myelography in three cases showed a filling defect opposite the 6th intervertebral disc, involving the 7th cervical root on the affected side.

The clinical and radiological evidence suggested that the brachial pain was caused by a herniation of the 6th cervical intervertebral disc.[1]

We are indebted to Major Hugh Davies, RAMC, for the radiological investigations; and to Lieut.-Colonel C. G. Greenway, RAMC, for permission to use hospital case-records.

REFERENCES

Bradford, F. K., Spurling, F. G. (1941) The Intervertebral Disc, Springfield, Mass.
Elliott, F. A. (1944) *Lancet*, i, 47.
Elsberg, C. A. (1931) *Bull. neurol. Inst.* 1, 350.
Haglund, F. (1942) *Acta radiol.* 23, 568.
Hanflig, S. S. (1936) *J. Amer. med. Ass.* 106, 523.
Jonsson, E. (1939) Handbuch der pathologishe Anatomie, Berlin.
Love, J. G., Walsh M. N. (1938) *J. Amer. med. Ass.* 111, 396.
Peet, M. M., Echolls, D. H. (1934) *Arch. Neurol. Psychiat.* 32, 925.
Pennybacker, J. (1940) *Lancet*, i, 771.
Semmes, E., Murphy, F. (1943) *J. Amer. med. Ass.* 121, 1209.
Spurling, R. G., Scoville, W. B. (1944) *Surg. Gynec. Obstet.* 78, 350.
Stookey, B. (1940) *Arch. Surg.* 40, 417.
Steindler, A., Luck, J. (1938) *J. Amer. med. Ass.* 110, 107.
Symonds, C. P. (1943) *Med. Ann.* p. 310.
Turner, E. L., Oppenheimer, A. (1936) *Ann. intern. Med.* 10, 427.
Weddell, G., Feinstein, B., Pattle, A. (1943) *Lancet*, i, 236.

1. This has subsequently been confirmed by operation on three similar cases not included in the above series.

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CAVERNOUS SINUS THROMBOSIS TREATED WITH PENICILLIN

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A MARRIED woman, aged 19, a machinist by occupation, was admitted to hospital on June 30, 1944, notified as erysipelas. She had been treated at home for 4 days, receiving about 15 g. of sulphanilamide by mouth. A small boil had appeared on the tip of her nose a week before the onset of her illness.

THE FIRST WEEK

On admission she looked very ill, T. 102° F., P. 90, R. 22 per min. The upper part of her nose and forehead was œdematous and dusky red, and there was intense bilateral swelling of the eyelids, so that it was almost impossible to inspect the eyes without causing pain. There was a small discharging boil just to the left of the tip of the nose. White-cell count 18,000 per c.mm. (polymorphs 72%, lymphocytes 20%, monocytes 8%). She was given sulphathiazole 1 g. every 4 hours and sedatives, with copious fluids by mouth. Next day there was little change; she was restless and delirious. On July 2, although her temperature was still high, she was more rational; her eyes showed slight but definite proptosis, justifying a tentative diagnosis of cavernous sinus thrombosis. On the 3rd her temperature began to fall and remained at about 100° F., but her general condition had deteriorated and she was comatose and resentful of all interference. There was severe proptosis of both eyes, and immense œdema of the eyelids with chemosis. The optic discs showed intense papillœdema. Six days after admission (July 5) she showed no improvement in spite of just over 30 g. of sulphathiazole by mouth and this was therefore discontinued. It was thought that penicillin held out the only chance of recovery and fortunately a supply became available. As soon as it arrived, 100,000 units was given intravenously at 4.15 PM on the 5th and a similar dose was given intramuscularly at 10 PM. Cultures from the boil on her nose, which had not completely healed, showed coagulase-positive *Staph. aureus*, which was penicillin-sensitive. Next day she was given 100,000 units of penicillin at 10 AM and 7 PM. There was much less swelling in the left eyelids and a good deal less œdema of the face. The temperature dropped to normal and her general condition was much improved. Red cells 3,860,000 per c.mm., Hb 67%, colour-index 0·87; white cells 28,000 per c.mm. (polymorphs 82%, lymphocytes 16%, monocytes 2%). There was still well-marked papillœdema, with immobile pupils, and ocular movements were impossible. By the 7th the patient was feeling much better, and the swelling of the eyelids on both sides was much more localised. Another 100,000 units of penicillin was administered at 10 AM, a total of 500,000 units in 3 days. At 7 PM the patient said she felt very well.

On July 8 she improved still further. The œdema of the lids had now subsided enough for her to open both eyes slightly, although both eyeballs were still immobile. A further 200,000 units of penicillin was given during the day.

DEVELOPMENT OF ENCEPHALITIS

On July 9, at 5 PM, the patient seemed somewhat drowsy and complained of headache and nausea, for which no adequate cause was found. Next morning her headache was better, but she was still drowsy and apathetic. There were no signs of meningitis. White cells 20,000 per c.mm. (polymorphs 80%, lymphocytes 16%, monocytes 4%). Mr. C. Tivy kindly examined her eyes and reported:

Right eye.—Some proptosis. Movements very limited. Pupil semi-dilated but active. Media clear. Upper edge of optic disc swollen and œdematous. Lower edge clear-cut.

Left eye.—Slight proptosis. Movements a little better than the right, but very limited. Pupils active. Upper half of optic disc swollen and blurred. Central cap filled up. Veins moderately dilated. Both eyes recovering from papillœdema.

On July 11 she was still drowsy and uninterested in her surroundings. The left eye was now almost normal and all its movements had returned. In the right eye there was still much conjunctival chemosis, but the muscles had begun to function satisfactorily with the exception of the internal rectus. Two days later (13th) both eyes were almost normal, but there was some ptosis of the right upper lid. She complained of headache and vomited once or twice. Nothing could be found to account for this. She continued in much the same state for the next 4 days, when (17th) both lids of the right eye swelled up again and her conjunctiva became so œdematous that it hung down like a curtain. White cells 15,000 per c.mm. (polymorphs 68%, lymphocytes 27%, monocytes 5%). Mr. Tivy thought the reason might be some residual infection in the ethmoidal sinus, but X rays reveal no abnormality. Some improvement followed instillation of adrenaline into the eye, but her general condition steadily deteriorated.

On July 19 penicillin was resumed and she was given 100,000 units twice daily for 3 days. There was an instant response. Almost all her signs and symptoms disappeared except for slight proptosis of the right eye and occasional diplopia. White-cell count on the 22nd, 10,000 per c.mm. (polymorphs 71%, lymphocytes 27%, monocytes 2%). Two days later she was able to get out of bed for short periods, and her progress seemed very satisfactory. Apart from slight ptosis of the right upper lid there were no physical signs and her general condition remained excellent until the 28th, when she complained of headache and lassitude. Red cells 4,610,000 per c.mm., Hb 78%, CI 0·84; white cells 10,500 per c.mm. (polymorphs 68%, lymphocytes 30%, monocytes 2%). The headache became gradually more pronounced; it was centred over the left frontal region, was worse first thing in the morning, and was accompanied by nausea, occasional vomiting, and complaint of a bad smell which she thought was due to the drains—an idea vigorously repudiated by her attendants! Her pulse-rate, which had been steady at 76–80, now rarely rose above 66 per min. Lumbar puncture showed a clear fluid under normal pressure; protein 85 mg. per 100 c.cm., globulin ++, an occasional lymphocyte present, no organisms. Blood WR negative. The headache became still more severe and constipation was now troublesome. There was pain and tenderness over the left frontal region, and her clinical conditions and the findings in the CSF strongly suggested an abscess in the left frontal lobe.

PROGRESS AT BURDEN INSTITUTE

At this stage she was admitted to the Burden Neurological Institute for further investigation and I am indebted to Surgeon Captain Lambert Rogers, RNVR, for the following notes.

On admission to the institute she was symptom-free. Slight bilateral proptosis and a patchy erythema of the upper part of the face. Fundi showed bilateral optic neuritis but no papillœdema. Eye movements normal. X ray of skull showed no abnormalities.

Electroencephalogram before operation (Aug. 8).—There was a very large, very slow delta discharge in the left frontal lobe which tended to spread towards the left temporal region. The frequency of this discharge varied, at times being as slow as 0·5 c./s. at other times showing a frequency of up to 2 c./s. This finding suggests a lesion in the left frontal lobe. To discover the nature of this it will be necessary to repeat the EEG in about 7 days' time, but the general picture is like that of an abscess.

Operation on Aug. 10, by Surgeon Captain Lambert Rogers.—Burr hole in left frontal region. Left frontal lobe needled. No abscess found. Lobe soft and non-resistant to needle. Ventricle tapped CSF not under pressure. Wound closed. Lumbar puncture performed, pressure 200 mm., clear colourless fluid. CSF then allowed to escape and replaced by 10 c.cm. (10,000 units) of penicillin in head-down position. Patient rather drowsy and obfuscated after operation. Absent abdominal reflexes on right; right knee-jerk more brisk than left; plantars, right no response, left flexor.

Electroencephalogram after operation (Aug. 22).—There was a sharp focus of very slow delta waves in the left temporal region. The left frontal lobe now showed very little abnormality. The amplitude of the delta discharge was higher than was previously reported, but remained unusually slow in frequency at 0·5–1·5 c/.s., suggesting a progressive rather than a recovering lesion in the left temporal region, probably involving the deeper structures as well.

By Aug. 25 she was much improved. No headache. No proptosis. No signs of a gross neurological lesion.

Dr. F. L. Golla, director of the institute, sent her back to the City Isolation Hospital on Sept. 5 with the following report:

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"The slight bilateral proptosis together with the neuritic symptoms led the surgeons to consider that they probably had to deal with a frontal abscess. Nothing was found at operation. Penicillin was used as a precautionary measure and the patient has made an absolutely good recovery. One can only assume that there was at one time a marked inflammatory reaction simulating abscess and that this has now completely subsided."

On re-examination at this hospital the patient seemed very well and no abnormality whatever was found. The optic discs appeared normal. Red cells 4,150,000 per c.mm., Hb 74%, CI 0·89; white cells 7900 per c.mm. (polymorphs 63%, lymphocytes 31%, monocytes 6%). She was discharged on Sept. 7.

DISCUSSION

Septic thrombosis of the cavernous sinus has a high mortality-rate—almost 100%—and there is little doubt that but for the penicillin this patient would have died. Altogether she received 1,310,000 units. A similar case of unilateral cavernous sinus thrombosis treated at this hospital a few weeks ago succumbed, in spite of showing improvement at first with heavy dosage of sulphathiazole and sulphadiazine.

The case illustrates the following points. In cavernous sinus thrombosis following staphylococcal infection of the skin penicillin is probably the drug of choice and should if possible be used at the outset and continued until the infection is completely under control. Treatment should be continued at the earliest sign of relapse. If treatment with sulphathiazole fails after say 20–30 g. of the drug, it seems useless to persist in further administration. Probably sulphathiazole would be better used while awaiting supplies of penicillin and stopped as soon as these became available. If in this case it had been possible to start penicillin therapy early and in adequate dosage, it is likely that rapid recovery would have ensued without complication. But the ultimate recovery suggests that even when a severe infection comes under treatment at a late stage penicillin is worth a trial. The case also illustrates how an encephalitis may simulate a cerebral abscess.

I have to thank Dr. T. Pierson, medical officer of health for Plymouth, for permission to publish this case. I wish to acknowledge the help I received from the Royal Naval Medical Service, especially from Surgeon Rear-Admiral F. J. D. Twigg and Surgeon Commander T. W. Froggatt who made supplies of penicillin available and gave me much kindly advice, and to thank Surgeon Captain Lambert Rogers and Dr. Golla for permission to include reports from the Burden Neurological Institute.

CAVERNOUS SINUS THROMBOSIS
TREATED WITH HEPARIN AND SULPHATHIAZOLE

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SINCE Seydell's report in 1939 of a recovery from thrombosis of the cavernous sinus after sulphanilamide treatment, many others have been recorded (Morrison and Schindler 1940, Skemp et al. 1941, Eichorn 1941, Wolfe and Wolfe 1941)—some in conjunction with heparin (Lyons 1941, Schall 1941). In the following case heparin was used in conjunction with sulphathiazole.

A woman clerk of 37 was admitted to hospital 2 days after the appearance of a pimple over the left upper eyelid, which developed into bilateral orbital œdema. Temperature 103·5° F., pulse-rate 120, and respirations 30 per min. The lymph-glands on the left side of the neck were enlarged; headache was slight; no signs of meningism; no ocular palsy. A diagnosis of thrombosis of the cavernous sinus was based on the bilateral orbital cellulitis consequent on a unilateral palpebral lesion. Treatment consisted of 42 grammes of sulphathiazole given at the rate of 1 g. by mouth 4-hourly, with 1 g. of sulphapyridine soluble t.d.s. intramuscularly for 3 days. Heparin was given in an intravenous glucose-saline drip, hourly at first and continuously from the second day onward. In all 120,000 units were given over 5 days; the clotting-time during this period was 16–30 minutes.

The day after admission infra-orbital discoloration appeared on both sides, and 4 days later the temperature became normal. A culture from the lesion showed a pure growth of hæmolytic streptococci. Blood-count: red cells 4,700,000 per c.mm.; Hb 61%; CI 0·64; white cells 6700 per c.mm. polymorphs 53·1%, lymphocytes 43·1%, mononuclears 2·1%, eosinophils 1·1%, myelocytes 2·1%). From the 6th day onward the temperature remained normal. The œdema subsided completely on the right side, and the side of the lesion soon showed a similar, though gradual, reduction. This enabled us to examine the ocular movements with greater satisfaction. These, together with the fundi, were normal. She was discharged on the 23rd day with some residual incrustations over the left eyelid, which did not take long to flake off. When seen again, 5 months later, she was in good health except for occasional drawing headaches over the vault, which had arisen since the lesion. Neither visual nor oculomotor disturbances could be detected. The palpebral discoloration had disappeared completely.

The continuous intravenous infusion of heparin was found to be more economical than hourly injections. Upon withdrawal of the drip the blood-coagulation time returned to normal within half an hour (as determined by the capillary tube method); heparin was therefore eliminated rapidly from the body.

I am indebted for permission to publish the case to Mr. G. H. Steele, FRCS, under whom the patient was admitted. My thanks are also due to Dr. S. Keys for the pathological findings.

REFERENCES

Eichorn, J. P. (1941) *Ohio St. med. J.* **37**, 1076.
Lyons, C. (1941) *Ann. Surg.* **113**, 113.
Morrison, L. F., Schindler, M. (1940) *Ibid*, **38**, 948.
Schall, L. A. (1941) *Trans. Sect. Laryng. Otol. Rhin. Amer. med. Ass.* p. 17.
Seydell, E. M. (1939) *Arch. Otolaryng., Chicago*, **30**, 429.
Skemp, H. I., Afremow, M. L., Rhoads, P. S. (1941) *Ibid*, **34**, 1025.
Wolfe, C. T., Wolfe, W. C. (1941) *Arch. Otolaryng., Chicago*, **33**, 81.

ABDOMINAL TOPOGRAPHY
CLINICAL ASPECTS

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THE medical student, beginning to study the surgery of the abdomen, is perplexed to find that intra-abdominal disorders may not only give rise to different types of pain in different sites, but that there is no unanimity as to these sites. For example, in practically all the standard textbooks he learns that the pain in obstructive appendicitis may first be felt in the epigastrium or the umbilical region or in both. Similarly, it is often stated that biliary colic may be localised in either of these regions or in both. In point of fact the visceral pain element (or component) in each of these two conditions is felt in the midline of the abdomen in a definite site which is constant for each and every patient suffering from appendicular or biliary colic.

The ambiguity of pain localisation arises out of the present system of anatomical division of the abdomen into regions, following the method of Cunningham (1893) (fig. 1). To illustrate an extreme example—

A man aged 42 was admitted to the ward suffering from an appendix abscess in the right lower abdomen following acute appendicitis with perforation. He had a typical history of colicky midline pain at the onset of his illness, situated about midway between the xiphisternum and the pubic symphysis. On dividing his abdomen into the customary anatomical zones by the subcostal and intertubercular lines it was found that the patient had no umbilical zone. His pain would thus be described as being felt in the epigastrium and hypogastrium (fig. 2). This man had no deformity of the spine, ribs or pelvis.

On May 23, 1892, William Anderson read before the Anatomical Society a paper entitled "A Plea for Uniformity in the Delimitation of the Regions of the Abdomen." There were at that time 14 different schemes of delimitation into the nine historical regions of the abdomen, and it was Anderson's plea that led to the appointment of a committee of the Anatomical Society to try to get uniformity. In his address Anderson

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said: "If we retain the subdivision into nine segments, it remains only to discuss the method of delimitation. Firstly, for the horizontal planes, the most ancient system and perhaps the best is that quoted in Le Clerc's *Epitome of Surgery* (published in English, 1696). Here the linea alba is subdivided into three equal parts, and the superior horizontal line lies at the junction of the upper and middle thirds, the inferior at the junction of the lower and middle thirds."

However, Cunningham's suggestion (1893) to modify Quain's "subcostal" and replace the "interiliac" by the intertubercular plane was accepted, and his is now the standard method. In 2 (one male and one female) of 16 subjects examined by Cunningham, the subcostal (Quain's) and interiliac lines coincided, while in the others the distance separating these planes varied from ½ inch to 2½ inches. It was to make the umbilical zone larger that he replaced the supra-iliac plane by the intertubercular. Using this method he found that in his 16 subjects the breadths of the resulting umbilical zones varied from 1½ to 4 inches, while the costal and hypogastric zones, as measured along the middle line in front, averaged 6 and 5 inches.

PRESENT INVESTIGATION

To investigate further the relationship which the umbilical zone bears to the distance from the apex of the xiphisternal notch (lower border of the gladiolus of the sternum) to the upper surface of the pubic symphysis, the abdomens of the first hundred patients admitted to the wards were measured. Three classes were taken—(*a*) males aged 14–80 years; (*b*) females aged 14–80 years; and (*c*) children aged 2–14 years. Class (*c*) was further divided into those aged 2–4, 5–9 and 10–14 years. All patients were normal in that there was no deformity of the spine, ribs or pelvis. Measurements were made with the patient lying on his or her back on a flat surface, the position that a patient being examined for an intra-abdominal complaint usually adopts.

RELATION AT DIFFERENT AGES BETWEEN DEPTH OF UMBILICAL ZONE (U) AND DISTANCE FROM XIPHISTERNAL NOTCH TO SYMPHYSIS PUBIS (L)

Age (yrs.)		... 2–4	5–9	10–14	15–20	21–30	31–40	41–50	51–60	61–70	71–80
Proportion U/L	M.	1/3	1/5	1/5	1/5	1/6	1/6	1/7	1/7	1/7	1/9
	F.				1/5	1/6	1/6	1/7	1/7	1/8	1/8

It will be seen from the table that as age advances there is progressive narrowing of the vertical width of the umbilical zone (fig. 3). This is especially well marked in patients of hyposthenic build. Sthenic patients tend to retain the wide umbilical zone forming a third of the distance from xiphisternum to symphysis pubis, as seen in children from the ages of 2 to 5 years.

To attempt to ascribe a definite locality to a central abdominal pain is obviously impossible using the standard topography. A scheme in which the width of the umbilical (and costal) zone depends on such a variable factor as the obliquity (slope, as Cunningham termed it) and length of the ribs is of little value in determining the position of the abdominal viscera, or in localising pain produced in, or indirectly by, these viscera. It is strange that it has been so long retained. The thoracic kyphosis of advancing years and of certain occupations is no doubt an additional factor influencing the relative widths of the abdominal zones. After emphasising that appendicular colic is always localised in the umbilical region (the early embryological, or primary relative position of the appendix) (Brown 1942) it is somewhat disconcerting to find that the patient demonstrated on has in fact no such region.[1] It is obvious, too, that a high iliac crest will increase the depth of the hypogastric zone and diminish the depth of the umbilical zone, and a low iliac crest vice versa, but the size and

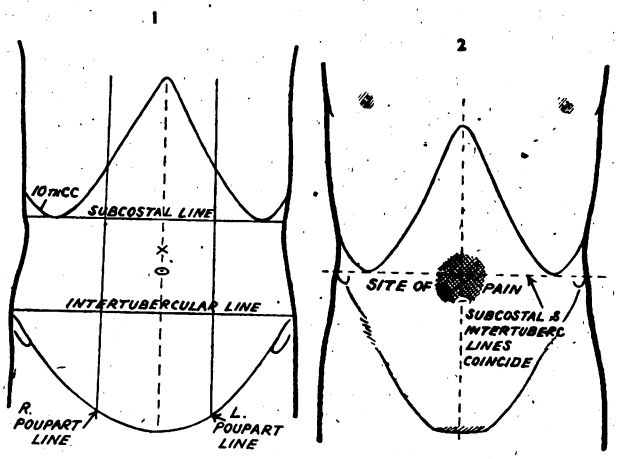

Fig. 1—Cunningham's method of abdominal topography. The disadvantage of using this method is illustrated in figs. 2, 3 and 4. Compare with fig. 5.

Fig. 2—Abdominal topography of man of 42, suffering from acute appendicular colic in the shaded area. With Cunningham's method there is no umbilical zone; the pain therefore is situated in the epigastrium and hypogastrium. The umbilicus is in the hypogastrium.

1. An interesting clinical observation is that operations for biliary and renal conditions in very stout patients are often surprisingly easy. The reason is that stout patients, being almost invariably of sthenic build, have a wide subcostal angle and a large intercosto-iliac space. Free access to the biliary tract and kidney is thus obtained.

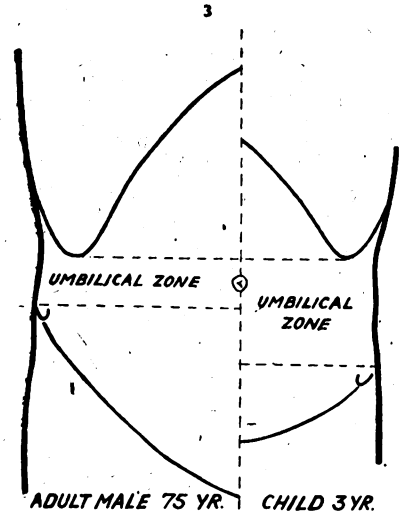

Fig. 3—Abdominal topography of a man of 75, and of a child of 3 years, showing the relative sizes of the umbilical zones—wide in the child and narrow in advanced age.

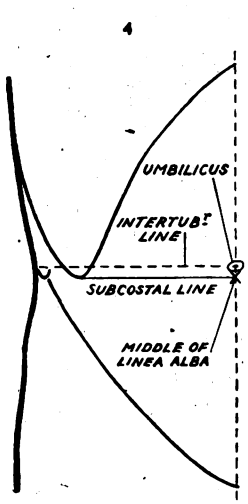

Fig. 4—Male, aged 58. The subcostal and intertubercular lines (of Cunningham) overlap by half an inch. There is no umbilical region, no lumbar region, no loin. The umbilicus is wholly in the epigastrium and half in the hypogastrium.

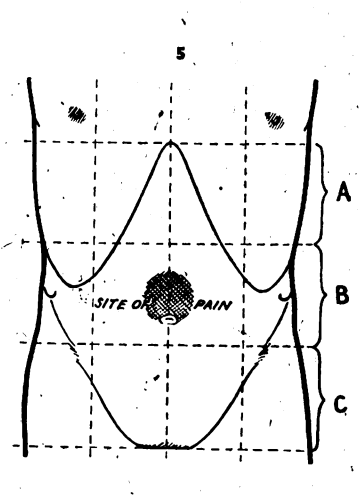

Fig. 5—The same abdomen as in Fig. 2, now divided into regions using the modification of Le Clerc's method of topography. Epigastric (A), umbilical (B) and hypogastric (C) regions are now each a third of the linea alba in depth. The site of pain is now the umbilical region. The umbilicus is in the umbilical region.

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height of the iliac bones seem to be less variable than the length and slope of the ribs.

To state without qualification, as is often done, that the pain of an abdominal disorder is felt around (or above, or below) the umbilicus conveys no reliable information as to the exact position of the pain, and attempts to regionalise the umbilicus and midpoint of the linea alba, or to correlate these two landmarks with Cunningham's three zones, simply make confusion more confounded. Whichever topographical scheme is adopted the position of the umbilicus must be completely ignored.

In our series the following facts emerge (using Cunningham's topography)—

Regional position of midpoint of linea alba.—This was high in the umbilical area in fully half the cases; in the centre of the umbilical area in 21; below the centre in 9; it was in the epigastrium in 4; on the subcostal line in 7; on the intertubercular line in 1; and in the hypogastrium in 2.

Position of umbilicus relative to centre of linea alba.—In the great majority the umbilicus was below the centre of linea alba. In 8 cases the umbilicus and centre point coincided; in 4 cases the umbilicus lay above the centre point.

Regional position of umbilicus.—Low in the umbilical area in about two-thirds of the cases; middle of the umbilical area in 14, and high in umbilical area in 3; in the epigastrium in 1; on the intertubercular line in 9; in the hypogastrium in 3.

Comparative widths of three zones (as measured along the linea alba).—All three were equal in only one case, a woman aged 38 of sthenic build. The costal zone was the widest in 46; the umbilical zone the widest in 3 (children of 2 years); and the hypogastric zone the widest in 14 (3 males and 11 females).

The costal zone was the narrowest in none; the umbilical zone was the narrowest in 63; and the hypogastric zone the narrowest in 5 (3 children of 2 years, 1 of 8 years and a man of 58).

The costal and hypogastric zones were of equal width in 19; the umbilical and hypogastric zones were of equal width in 1 (a man of 40).

The costal zone was as wide as, or wider than, umbilical and hypogastric zones together in 9 cases. The hypogastric zone was as wide as, or wider than, costal and umbilical zones together in 2; in both cases the umbilicus was in the hypogastrium.

The umbilical zone occupied a third of the abdomen in 4 (3 children of 2 years and 1 woman of 38). There was no umbilical zone in 2 patients. In the man of 42 already referred to the subcostal and intertubercular planes coincided (fig. 2). In a male aged 58 years these two planes overlapped by half an inch (fig. 4). In the man of 42 the hypogastrium was not as wide as the epigastrium but contained the umbilicus. In the man of 58 the epigastrium was the narrower and the umbilicus was on the intertubercular plane *above* the subcostal plane and above the midpoint of the linea alba (on the subcostal plane). The umbilicus, therefore, was wholly in the epigastrium and half in the hypogastrium.

Recently we had in the wards at the same time three patients suffering from acute appendicitis. All had had central visceral pain at the onset of the illness. This pain was in exactly the same position in all, but in a different region in each.

A young child suffering from appendicular or small intestine colic has his pain in the umbilical region, for the simple reason that he has a relatively wide umbilical region (fig. 3). The same patient, as an adult, with the same complaint may have his pain in any one of the three central regions, in any two, or in all three. It mainly depends on the adult length and slope of his ribs, and yet the patient will maintain, rightly, that his attacks of pain have always been felt in the same position.

Renal pain is usually described as being localised in the lumbar region or in the loin. If the term "lumbar region" is used in the topographical sense, it is obvious from our investigation that such a description must in many cases be inaccurate, since a considerable percentage of people have a very narrow umbilical zone (which includes the lumbar region), and some have no umbilical zone. This difficulty may be avoided by stating that renal pain is felt in the loin, but that also is not an accurate or desirable description because the loin has not easily identifiable boundaries, and because in some cases the last rib and iliac crest overlap. Where the subcostal and intertubercular planes coincide, an accurate description of renal pain would run somewhat like this: "The pain was situated in the right hypochondrium and right iliac regions because the patient has no right lumbar region because the subcostal and intertubercular planes coincide because the ribs are longer and more oblique than is usual, and because the costal and hypogastric zones are of equal width." Not a desirable method of description, but how can it be avoided with our standard scheme of topography?

SUGGESTED DIVISION OF THE ABDOMEN

It is necessary for the teaching of anatomy and surgery to have a rational and convenient method of subdividing the abdomen into regions; and above all the method chosen should be helpful in clinical practice and free from ambiguity. The present names of the nine historical regions should be retained as they serve a definite end for descriptive purposes. To provide a method of dividing the abdomen into regions to which pains of the visceral type particularly may be attributed more exactly, the length of the linea alba should be divided into thirds irrespective of bony landmarks—as first suggested by Le Clerc in his Epitome of Surgery. The three zones thus defined should be further subdivided by the two vertical lines in general use—viz., two perpendicular lines reared from the midpoints of the inguinal ligaments (fig. 5).

If such a scheme were adopted one could dogmatise by saying that visceral pain from the embryonic foregut derivatives—stomach, duodenum, biliary passages and pancreatic ducts—would always be felt in the midline in the upper third (in the epigastrium). Similar pain from mid-gut derivatives, for example the appendix, would always be felt in the middle third (umbilical region), and pain from the hind-gut derivatives, such as colon, in the lower third (the hypogastrium).

The obvious advantage of this scheme over that of Cunningham is that it ensures that every patient will retain the well-proportioned umbilical zone of childhood irrespective of the length and slope of his ribs or of the height of his iliac crests.

The ambiguous indefinite descriptions prevalent in current medical literature and in clinical teaching regarding the localisation of abdominal pain would thus be avoided and replaced by clear and exact descriptions. For example, using the suggested method, one could state that acute appendicular colic is invariably localised in the umbilical region, whereas in chronic appendicitis pain may be present in the epigastrium. In the acute case the central visceral pain is produced in the appendix by hypercontraction of its muscular wall and is retrojected to the primary relative position of the appendix—i.e., the umbilical region. In the chronic case the epigastric pain is not produced in the appendix but by reflex pylorospasm—the ileo-gastric syndrome (Braithwaite 1942)—and hence the difference in localisation. The later local pain of acute appendicitis, usually in the right iliac fossa, is a somatic pain due in the first place to chemical irritation of the adjacent parietal peritoneum. Thus we can state, as a general rule, that in visceral pain it is the early embryological position of the viscera we must bear in mind, while in somatic pain it is the permanent position of the viscera which is important. In other words, visceral pain tells us which segment of gut is at fault, and somatic pain tells us exactly where the lesion is to be found.

A clear conception of how these two types of pain are produced and what they signify adds interest to the study of abdominal pain, and is essential for early, accurate and logical diagnoses. In spite of the teaching of Hurst (1911), Morley (1931) and others it is rarely that one meets a practitioner who is really interested in the study of abdominal pain; hence the continued high mortality, due to late diagnosis, in many abdominal disorders.

SUMMARY

The standard system of anatomical division of the abdomen into regions is of little value in clinical practice, for it is based on landmarks whose position varies with age, build, degree of kyphosis, &c.

It is suggested that the present system be replaced by a modification of Le Clerc's system. The linea alba is

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divided into thirds by horizontal lines, and two perpendicular lines are reared at the midpoints of the inguinal ligaments.

With this system of abdominal topography the exact site of abdominal pain can be definitely and accurately described in unambiguous terms which can be understood by everybody.

We are indebted to Prof. J. C. Brash, anatomical department, Edinburgh University, for a helpful personal communication.

REFERENCES

Anderson, W. (1892) *J. Anat. Physiol.* **26**, 543.
Braithwaite, L. R. (1942) *Brit. J. Surg.* **30**, 15.
Brown, F. R. (1942) *Brit. med. J.* i, 543.
Cunningham, D. J. (1893) *J. Anat. Physiol.* **27**, 257.
Hurst, A. F. (1911) The Sensibility of the Alimentary Canal, London.
Morley, J. (1931) Abdominal Pain, Edinburgh.

THE MENINGOCOCCAL-ADRENAL SYNDROME

FIVE CASES WITH ONE RECOVERY

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THE clinical concept of meningococcal infection has in the past been dominated by meningitis, its commonest manifestation, but in recent years there has been an increase in the recognition of meningococcal septicæmia without meningitis. There is an extensive literature devoted to the chronic type of meningococcal septicæmia characterised by intermittent pyrexia, petechial and maculopapular skin eruptions and sometimes nodular lesions resembling erythema nodosum (Applebaum 1937, Heinle 1939, Stott and Copeman 1940, Dickson et al. 1941, Copeman 1942). The acute fulminating type of septicæmia with adrenal hæmorrhage, with which we are concerned in this paper, is still regarded as comparatively rare and not more than a hundred cases have been recorded (Banks and McCartney 1943). Since death usually occurs in a matter of hours it may not be recognised as frequently as it should be outside fever hospitals or other large centres.

Meningococcal infections may now be classified in the following main groups, all of which should be easy to recognise if the characteristic clinical pictures be borne in mind (Harries 1942, Banks and McCartney 1943).

1. *Meningococcal septicæmia.*—(*a*) Acute fulminating septicæmia, with extensive purpuric eruptions and adrenal hæmorrhages, death often occurring from circulatory failure in a few hours from the onset. (*b*) Chronic septicæmia, with intermittent pyrexia, petechiæ and skin lesions resembling erythema nodosum, occasionally arthritis, and later development of meningitis.
2. *Meningitis.*—Acute, subacute, and chronic. These cases usually present no difficulty in diagnosis.
3. *Encephalitis.*—Although most cases of meningitis must from the nature of the infection have some degree of encephalitis, in some instances the intracerebral lesions are far in excess of the meningitic. Deep coma may be present and the signs of meningitis may be masked. The encephalitic type of onset often accompanies the acute adrenal syndrome, and the characteristic purpuric rash and circulatory failure are seen in both. Banks and McCartney (1943) state that, in epidemic times at least, there is a pure encephalitic syndrome, a pure adrenal syndrome, and a mixed encephalitic-adrenal syndrome, any of which may also include nasopharyngitis, septicæmia, and meningitis.

The adrenal syndrome, with which we are mainly concerned, is often called the Waterhouse-Friderichsen syndrome, but there is little justification for retaining this name on historical grounds, and even less as a descriptive term. The "meningococcal-adrenal syndrome" seems to us a concise and adequate name for the condition.

The clinical picture of the pure adrenal syndrome is very definite and once recognised cannot be forgotten. There is a sudden onset of a fulminating septicæmia, with a cyanotic pallor resembling the "heliotrope cyanosis" which has been described in connexion with influenzal septicæmia. Later multiple cutaneous petechiæ and possibly massive purpuric hæmorrhages appear. The pulse is rapid, of poor volume, and may be almost imperceptible. The blood-pressure is very low. Respiration is rapid and shallow, and may become Cheyne-Stokes in type. Consciousness may remain clear until the end, but as in cases 2 and 3 it may be slightly dulled. Death usually occurs within 24 hours of the onset in untreated cases. The difficulty in this type of case is in making a diagnosis and beginning treatment at the earliest possible moment. There is usually no time for laboratory investigation and the diagnosis must be made on clinical grounds alone.

When the adrenal syndrome occurs in cases with the presenting signs of meningitis or meningo-encephalitis it may be overlooked; but the above-mentioned clinical picture is present in variable degree. We would advocate that frequent blood-pressure readings be taken in all cases of severe meningococcal meningitis, since an abnormally low blood-pressure is the only reliable early sign of adrenal failure. If treatment be withheld until the characteristic cyanosis and rapid shallow respiration appear it may be too late to be effective. Recoveries from apparent adrenal lesions have been reported by Harries (1940) in three cases, Carey (1940) one case, and Banks and McCartney (1943) three cases.

Biochemical investigations in such cases have been scanty. There is naturally little time for extensive investigation of the blood chemistry. Magnusson (1934) found hypoglycæmia in four fatal cases and a non-protein nitrogen of 105 mg.% in one. He also quotes another case of Bamatter's in which the blood-sugar was normal, but the non-protein nitrogen was 131 mg.%. In this case also the serum sodium was raised (635 mg.%) and the serum potassium was normal (24 mg.%). Banks and McCartney in one patient who recovered found a diminished alkali reserve and an increased blood-urea.

CASE-REPORTS

The first three cases are remarkable in that they arose in the same family, consisting of husband, wife, and six children, and all ended fatally within four days. On the day that the first case occurred a child in a neighbouring house had died within a few hours of "purpura fulminans," but no details of this are available. A woman who had been in intimate contact with all four children was found to have type II meningococci in her nasopharynx and type II meningococci were also isolated from cases 1 and 3. No other carrier was found in either household and no other cases of meningococcal infection had been reported in the neighbourhood. It is almost certain that the death from "purpura fulminans" was due to the meningococcal adrenal syndrome.

CASE 1.—Male, aged 4 years. Admitted under J. MacD. H. on Dec. 7, 1943. Sudden onset of headache, vomiting, and a blotchy erythematous rash the previous evening. By the morning of Dec. 7 the rash had become deep purple and the patient was semistuporose. Definite signs of meningitis were present on admission and there was a petechial and massive purpuric rash over the whole body, most evident on the arms and legs. T 102·2° F, P 148, R 40, deep and stertorous. Lumbar puncture gave a slightly turbid fluid: pressure 300 mm., cells 600 per c.mm. (all polymorphs), chlorides 620 mg.%. Many extra- and intra-cellular gram-negative diplococci were seen in the stained films and culture gave type II meningococci. Soluble sulphapyridine 1 g. was given intravenously in 20 c.cm. of normal saline and 3 g. of sulphamezathine by mouth every four hours.

Dec. 8: meningitic signs less marked, temperature normal, but child still stuporose.

Dec. 9: still stuporose. No further pyrexia or purpura, but cyanosis present and respiration rapid and shallow. Pulse-rate 140, BP 85/70 mm. Hg. Rectal salines and 10 mg. of desoxycortone acetate given intramuscularly.

Dec. 10: no improvement. Pulse imperceptible. Some of the purpuric patches necrotic. Further 20 mg. of desoxycortone given and more saline. Death early in morning of Dec. 11.

Necropsy.—Intense lividity. Thymus present, weight 14 g. Lungs very congested and œdematous. No petechiæ on pleuræ or pericardium. Gross enlargement of mediastinal lymph-glands, which are livid in colour. Mesenteric glands also enlarged and livid. Small amount of free fluid in peritoneal cavity. Spleen normal in size, soft, weight 45 g.

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Retroperitoneal tissues intensely œdematous, particularly around kidneys. Both adrenals show focal hæmorrhages, with intervening areas of normal appearance. Brain intensely swollen and congested. Thrombosis of superior longitudinal sinus present and cortical veins very distended. Moderate amount of yellow purulent exudate in sulci.

Sections.—Adrenals show areas of recent hæmorrhage which have infiltrated the cortex and medulla without entirely destroying the structural outline. Brain shows a moderate degree of perivascular lymphocytic cuffing. Hyaline thrombi seen in small vessels. Thymus shows no histological abnormality.

CASE 2.—Female, aged 8 years, sister of the above. Admitted under J. M. C. on Dec. 8, 1943. Seen at home shortly before admission. Persistent vomiting and slight headache had begun 4 hours before; 2 hours later a widespread petechial rash, macular in places, developed. Mentally the child was slightly disorientated but could answer questions distinctly. No neck-rigidity. On admission to hospital the child had become comatose and the pulse was almost imperceptible. T 103° F, R 40. Pulse-rate and BP not obtained. Soluble sulphapyridine 1 g. given intramuscularly. CSF not under increased pressure, cells 1 per c.mm., protein 30 mg.%, chlorides 650 mg.%. No organisms seen in smears. Culture sterile. Died 3 hours after admission.

Necropsy.—Intense lividity. Generalised petechial and patchy purpuric rash, most marked on face, shoulders, abdomen, and legs. Thymus enlarged, weight 41 g. Œdema of mediastinum, with enlargement of tracheobronchial and cervical glands, some of which are livid on section. Lungs congested and grossly œdematous. Small amount of fluid in left pleural cavity. Heart: some ante-mortem clot in left ventricle: a few pericardial petechiæ and early pericarditis at base. Gross enlargement of mesenteric lymph-glands with hæmorrhage into some. Œdema of mesentery and retroperitoneal tissues, especially around kidneys. Bilateral suprarenal hæmorrhages with complete destruction of medulla of both glands, but no rupture of capsules. Spleen enlarged and congested, weight 177 g. Brain congested, but no other macroscopic abnormality seen.

Sections.—Adrenals show recent substantial hæmorrhage almost entirely replacing the medulla of both glands. Cerebral cortex shows no evidence of encephalitis. A mesenteric lymph-gland shows recent hæmorrhage. Thymus appears normal.

CASE 3.—Female, aged 15 years. Sister of the above two. Admitted under J. M. C. on Dec. 10, 1943, about ½ hr. after onset of vomiting and pyrexia. On admission T 102·8° F, P 140, R 40. Dusky cyanosis present. BP 90/70 mm. Hg. Slightly drowsy, but completely conscious, with no signs of meningitis. Blood was taken for culture and later type II meningococci were recovered. Soluble sulphapyridine 1 g. given intramuscularly every 4 hours, with 10 mg. of desoxycortone acetate. Plentiful glucose drinks containing sodium chloride and sodium bicarbonate also given and rectal salines. By the evening a profuse purpura had developed and the cyanosis was more pronounced. No improvement occurred and the child died 20 hr. after the onset, retaining consciousness almost to the end.

Necropsy.—Generalised intense lividity, with numerous small purpuric hæmorrhages. Thymus enlarged, weight 25 g. Lungs congested and œdematous. Small amount of fluid in left pleural cavity and a few pleural petechiæ. Numerous pericardial petechiæ. No gross enlargement of mediastinal or mesenteric lymph-glands. Retroperitoneal tissues very œdematous. A few petechiæ on mesentery and serous surface of intestines. Both adrenals replaced by massive hæmorrhages, but no rupture of capsules. Spleen slightly enlarged, weight 115 g. Brain œdematous and congested, but no evidence of meningitis.

Sections.—Both adrenals show massive recent hæmorrhages. Brain: a hyaline thrombus seen in one vessel. Spleen congested, many polymorphs seen in pulp. Thymus: no abnormality seen.

CASE 4.—(We are indebted to Dr. J. Sowerbutts and Dr. A. J. Rhodes for the report of this case.) Male, aged 3¼ years, an inmate of a children's home, was noticed to be slightly irritable on the night of Dec. 18, 1943. At midnight he soiled his bed and was seen by a nurse, who noticed no other abnormality. At 6 AM next morning he was found dead and with a generalised purpuric rash. Dr. Sowerbutts mentioned the case to one of us on the telephone, who suggested a diagnosis of meningococcal-adrenal syndrome. A post-mortem examination was carried out the same morning by Dr. A. J. Rhodes, who has kindly given the following details.

Necropsy.—Well-marked lividity. Profuse petechial and in parts purpuric-hæmorrhagic rash over limbs and trunk. Blisters on front of right shin. Moist area on dorsum of left foot where it had been denuded of epithelium. Numerous petechial hæmorrhages under serous coat of intestines, in mesentery, mediastinum, pericardium and pleuræ. Heart and lungs normal. Adrenals: well-marked hæmorrhages completely destroying normal architecture. Brain markedly congested with flattened convolutions. CSF turbid. Dr. Rhodes concluded, from the absence of any primary focus of infection, that death was due to fulminating meningococcal septicæmia with adrenal hæmorrhages. No attempt to isolate the meningococcus was made because the body was cold.

This case occurred in a town 12 miles away from the others and no contact between them could be traced. Nasopharyngeal swabs taken from 9 staff and 31 inmates of the children's home revealed no meningococci, but prophylactic sulphapyridine had been given to everyone during the previous 24 hours.

CASE 5.—Female, aged 21 years. Admitted under J. MacD. H. on Dec. 24, 1943, with severe meningitic symptoms. Very restless and irritable, but conscious. Slightly cyanosed, but, apart from a few rose-coloured spots which faded on pressure, no rash. Two large blisters on dorsum of left foot. T 101° F, P 140, R 26, BP 90/80. Illness had begun early the previous day with vomiting and a rigor. Later that day intense headache and cerebral irritation developed. CSF pressure 300 mm., fluid very purulent. Gram-negative diplococci found in smear. Soluble sulphapyridine 2 g. given intravenously and followed by 2 g. of sulphathiazole every 4 hours by mouth. Blood-urea 63 mg.%; blood-sugar 0·082%; serum-potassium 39·2 mg.%; serum-sodium 407 mg.%.

Dec. 25: T 100° F, P 124, R 38. Much less irritable, but confused. Cyanosis has increased. BP 90/80. Desoxycortone acetate 40 mg. given intramuscularly, and intravenous drip of 10% glucose-saline begun.

Dec. 26: T 100·5° F, P 110, R 32, BP 98/85. Further 10 mg. of desoxycortone given intramuscularly. Three litres of glucose-saline given intravenously in past 36 hours.

Dec. 27: T 97° F, P 88, R 22, BP 120/80. Slight generalised œdema, probably due to saline infusion and desoxycortone. Urinary output normal. No albuminuria. Mental condition normal, but still has slight neck-rigidity and headache. Sulphathiazole stopped. Total dosage of sulphonamides 13 g.

Dec. 28: T 98° F, P 76, R 20, BP 125/65. No headache. Blood-urea 27 mg.%; serum-potassium 13·6 mg.%; serum-sodium 343 mg.%; blood-sugar 0·112%. Further progress was uneventful. Intravenous glucose-tolerance test done on Jan. 1, 1944, gave the following normal result—fasting blood-sugar 0·118%; 20 g. of glucose given intravenously; blood-sugar after ½ hour 0·200%, after 1 hour 0·123%, after 1½ hours 0·118%, and after 2 hours 0·108%.

This patient was assumed to have adrenal lesions in view of the lowered blood-pressure, low blood-sugar, raised respiration-rate and cyanosis, but it must be admitted that the signs of the adrenal syndrome were not pronounced. The only definite cutaneous lesions were the blisters on the left foot and a few rose spots. Some of the cyanosis may have been due to the sulphathiazole, but it was present before this was given and was more pronounced than is usual in sulphonamide therapy of similar dosage. Culture of the blood and cerebrospinal fluid was not attempted. There was no traceable contact with the other cases.

DISCUSSION

The various acute manifestations of meningococcal infection are well illustrated by these five cases. Case 1 is an example of the mixed meningoencephalitic adrenal syndrome. Cases 2, 3 and 4 are probably all the pure adrenal syndrome, or with only slight cerebral lesions. In case 5 the adrenal lesion is hypothetical, but the meningitis and septicæmic symptoms were very pronounced.

It is not clear what factors are responsible for the adrenal syndrome. In the present series there was no epidemic of meningococcal infection in the district, although a few mild sporadic cases had occurred. The incidence of the adrenal syndrome is therefore high. In a small epidemic of 23 cases in this district in 1940 there

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was only one case with the clinical features of the adrenal syndrome. It has been suggested that the acute fulminating septicæmic cases occur early in an epidemic before any herd immunity has developed. The prophylactic administration of small doses of sulphapyridine to those in contact with these cases may have prevented further spread of the infection.

The post-mortem findings in many of the recorded cases suggest that death is due to circulatory collapse from a severe diminution in blood-volume. Three of our fatal cases showed widespread œdema of the lungs and interstitial tissues. This was also noted in 3 cases by Morison (1943). In case 5 œdema did in fact appear, but it was attributed to the large volume of saline infused and the desoxycortone. The chemical findings in case 5 are difficult to interpret, but may be due to dehydration in a stuporose patient with a high pyrexia. Another feature present in 2 of our cases was enlargement of the thymus and lymphatic glands. This was not due to the associated œdema. It was first mentioned by Rabinowitz (1923), again by Magnusson (1934), and was also noticed by Morison in his 3 cases. In view of the short duration of the illness and the apparently normal histological appearance of the thymus and lymphatic glands the enlargement must have been pre-existing. It is possible that the meningococcal adrenal syndrome occurs only in individuals with an inherent structural and functional deviation from normal in their thymolymphatic system and adrenal glands. This suggestion has little to support it as yet, but the presence of thymolymphatic enlargement in some of the more carefully recorded cases appears to be more than coincidence and worthy of detailed investigation. Much remains to be determined about the blood chemistry and hæmodynamics of the condition. It is doubtful whether the severe septicæmia or the adrenal lesions in themselves are entirely responsible for the rapidly fatal progress of these cases.

It is clear from the study of this series of cases and others that the successful treatment of the fulminating type of meningococcal septicæmia with adrenal lesions is impossible unless vigorous measures be taken to combat the circulatory failure. The sulphonamide drugs alone appear to be useless. The meningococci isolated from our cases were found to be non-resistant to sulphonamides in laboratory cultures, but in case 3, although sulphapyridine was given within half an hour of the onset of symptoms and 8 hours before the development of purpura, it had no effect on the rapid progress of the illness. In the few recorded instances of successful treatment of the condition the sulphonamide therapy has been supplemented by large intravenous infusions of saline or glucose-saline and injections of adrenal cortical extract or desoxycortone. If the cause of the profound circulatory collapse be a reduction in blood-volume it would be reasonable to use plasma-transfusion rather than glucose-saline.

SUMMARY

Five cases of the meningococcal-adrenal syndrome are described, four fatal and one which recovered, the diagnosis being presumed.

In three of the fatal cases gross œdema of the interstitial tissues was found. This lends support to the view that death is in large measure due to circulatory collapse from severe diminution in blood-volume.

In two of the fatal cases thymolymphatic enlargement was found, and it is suggested that this may be a factor in determining the susceptibility of the adrenals to the infection.

We are grateful to Dr. J. L. Edwards for the bacteriological and histological examinations.

REFERENCES

Applebaum, E. (1937) *Amer. J. med. Sci.* **193**, 96.
Banks, H. S., McCartney, J. E. (1943) *Lancet*, i, 771.
Carey, T. N. (1940) *Ann. intern. Med.* **13**, 740.
Copeman, W. S. C. (1942) *Brit. med. J.* i, 760.
Dickson, R. C., McKinnon, N. E., Magner, D., McGillivray, N. B. (1941) *Lancet*, ii, 631.
Harries, G. E. (1940) *Proc. R. Soc. Med.* **33**, 561. (1942) *Brit. med. J.* ii, 423.
Heinle, R. W. (1939) *Arch. intern. Med.* **63**, 575.
Magnusson, J. H. (1934) *Acta pædiat. scand.* **15**, 396.
Morison, J. E. (1943) *Lancet*, i, 800.
Rabinowitz, M. (1923) *Amer. J. med. Sci.* **166**, 513.
Stott, A. W., Copeman, W. S. C. (1940) *Lancet*, i, 1116.

URETERIC CALCULUS
TREATED BY REVERSED CATHETERISATION

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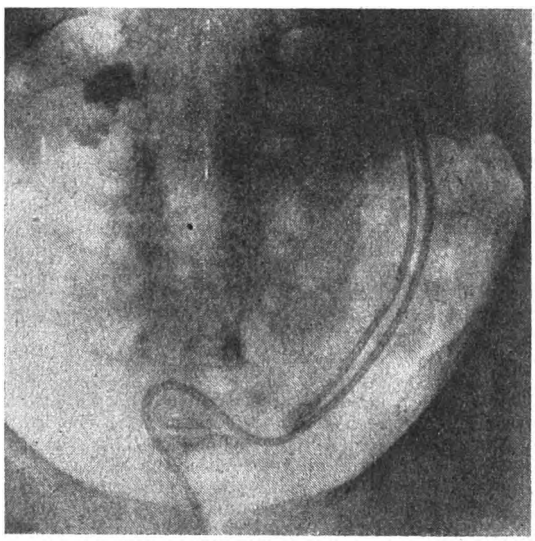
From one of HM Hospital Ships

THE ureteric calculus recently impacted and showing no sign of progress under observation is not a rarity. Several procedures have been described for dealing with such cases, but often the special instrument required is not available or the method advised is unsuccessful. Such procedures are the passage of ureteric dilators, spiral dislodgers, balloons, and bougies, the retrograde injection of lubricants, and the use of various ureteric stimulant and antispasmodic drugs.

Each of these methods has been successful in some cases, but no one method is sufficiently reliable to merit use as a routine. On a tropical station particularly, where such cases are likely to be met relatively often, it is desirable both from the patient's and "Service" aspect to treat them by instrumental methods rather than by open operation. All cases which have had



Reversed catheter engaging a small recently impacted ureteric calculus.

uretero-lithotomy performed on this station have been invalided for service in a cool climate. The purpose of this paper, therefore, is to draw attention to a useful yet simple method of dealing with the small recently impacted ureteric calculus.

The method, of which the one to be outlined is only a slight modification, was first described by Finney [1] of South Carolina, who found it successful in 49 out of 50 cases. In no case did appreciable trauma or reaction occur. Apart from an annotation in THE LANCET (1942, i, 298), I have seen no reference to Finney's original article; nor have I met anyone who has either known or confirmed the efficacy of the method.

My experience amounts to three cases only, two of which were entirely successful, while the third showed promise of a good ultimate result when the patient was transferred owing to Service reasons. Nevertheless, its simplicity and safety, and the excellent report of its originator, seem to offset the lack of a larger series.

The method is as follows. A long piece of fine silk is passed through the tip of a no. 6 X-ray catheter and tied, the knot being as small as possible. The silk passes along the outside of the catheter and then enters the lumen via a small needle-hole about the level of the 15 cm. mark. It is conveniently made to enter and run through the remainder of the catheter by attaching it to the stilette, which is then withdrawn. In Finney's original description the silk remained external to the catheter throughout its length, but I have found that the silk becomes taut and somewhat hindered in its passage up the ureter owing to frictional drag on the

1. Finney, R. P. *J. Amer. med. Ass.* 1941, 117, 2129.

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silk in the catheter channel of the cystoscope. Also, acting like the string of a bow, it tends to cause some trauma to the ureteric orifice (and no doubt to the ureter higher up) on traction. Moreover, traction made the unprotected silk produce penile pain by cutting into the urethral mucosa. Both disadvantages are easily overcome by passing the thread along the lumen of the catheter. The stilette is reintroduced fully before use. Cystoscopy is now performed and the catheter passed up the ureter. If there is difficulty in passing beyond the stone, and this is likely to be the chief obstacle, success has been achieved by withdrawing the stilette and injecting saline at the same time as the catheter is gently pushed upwards. The stilette is again introduced. When the catheter has reached the kidney pelvis the stilette is withdrawn for 2–3 inches, and a loop formed by pulling on the silk and pushing the catheter further up. The tip of the catheter is thus made to re-enter the ureter and begin a reversed course. The stilette is now removed and the silk and catheter together gently drawn down until the resistance of the calculus is met. An X ray is taken at this stage to confirm the relation of the reversed catheter with the stone, which may be engaged by the tip of the catheter or ensnared in the loop, the latter being the more satisfactory. The cystoscope is now removed and the patient returned to bed. A small traction-scale is attached to the silk and instructions left for a pull of 2 lb. to be applied for a short time every 2–3 hours. At the end of 24 hours the patient is given a short anæsthetic (gas and oxygen) in his bed, and a pull of 5 lb. is applied by the surgeon himself. Should this prove unsuccessful the procedure is repeated for a further 24 hours. If the calculus has not been dislodged at the end of this period further traction is inadvisable, and the catheter should be removed unless open operation is contemplated forthwith. Removal is achieved by releasing the silk and pulling on the catheter. In Finney's series of 50 cases, only one open operation was necessary.

CASE-RECORD

A petty officer, aged 38, was admitted on July 6, 1943, complaining of sudden sharp colicky pain in the left iliac fossa, radiating to the tip of the penis. There was slight frequency but no pain on micturition or hæmaturia. He had had a similar pain in the left loin a week before, lasting only a few hours. Physical examination revealed no abnormal signs, but the urine contained pus and red blood-cells and calcium oxalate crystals. X ray revealed a small rounded irregular opacity near the tip of the left ischial spine, which intravenous pyelography showed to be in the line of the lower end of the ureter. There was also slight dilatation of the ureter throughout its length.

On the 10th, at cystoscopy, there were slight œdema and petechiæ around the left ureteric orifice (LUO). Chromoscopy was normal on both sides except that the left showed a much less forceful efflux than the right. A no. 6 ureteric catheter was then passed up the left ureter and met initial obstruction at 5 cm. This was passed and 5 c.cm. of sterile liquid paraffin injected above and below the stone. The patient had no symptoms over the next six days and X ray showed no change in the position of the calculus.

On the 16th cystoscopy was again performed and a no. 6 X-ray catheter, with silk ligature attached, was passed up to the kidney pelvis, reversed, and gently drawn down until obstruction was met (see figure). Gentle traction now caused the efflux of debris from the LUO and produced a slight increase in its surrounding swelling, with some pain in the left iliac fossa. The patient was returned to bed and intermittent traction applied over the next 48 hours. He had no discomfort beyond aching in the left iliac fossa during actual traction, and voided urine normally. At the end of this period he was again cystoscoped in order to watch the LUO during withdrawal of the calculus (this procedure is unnecessary normally). Steady 5 lb. traction was applied and after about 10 seconds the calculus, surrounded by much debris, emerged from the LUO, followed by the catheter and silk. X ray now showed the calculus lying in the bladder and the ureter clear.

On returning to the ward the patient passed the calculus in the first specimen of urine voided. It was grey with a finely irregular crystalline surface, and measured 1 × 0·5 cm. There was neither pain nor hæmaturia after this procedure. Further cystoscopy on July 26 showed a rather patulous LUO but no œdema and a normal efflux. A ureteric catheter passed without obstruction to the kidney pelvis but retrograde pyelography showed slight dilatation still of the left ureter, with a small pocket at its lower end. The urine became clear of pus cells on Aug. 2, and he was discharged to duty on Aug. 5.

DISCUSSION

The advantages of this method are obvious—it is simple, effective, and as shown by Finney in his 50 cases has low risk to the patient. If the operation is successful the patient is soon fit to return to duty. If it fails, uretero-lithotomy may still be undertaken in the usual way, but as a rule invaliding to a cool climate is necessary later. In the case here described lithotomy would have been indicated if reversed catheterisation had failed, for there was beginning dilatation and infection of the urinary tract with no progress of the calculus, which later pyelography showed to be lodged in a small pocket.

The chief difficulty to be overcome in most instrumental methods is in manipulating the instrument past the stone. If this is not possible the method usually fails. In using the catheter as a lithotrite, saline can be injected while manipulations are made, and passage is thereby facilitated. The small stone offering complete obstruction to a catheter is likely to be passed spontaneously, while the one that allows the catheter to pass probably lies partially in a pocket and stands a high risk of remaining there. The size of the stone would naturally influence the type of treatment adopted, and in the cases treated personally the stones have exceeded 1 cm. in diameter. Finney, pointing out the dangers of applying too much traction, emphasises that *in no case should an attempt be made to extract the stone immediately*. His method is essentially one of gradual dilatation and is based on experimental work carried out on large dogs. He found that in every case a ureter would stand a pull of 5 lb. but none would stand 10 lb. Trauma to the mucosa was found to be minimal both experimentally and clinically. There is no tendency for the catheter loop to obstruct the ureter—in fact it aids drainage, since urine will pass alongside it and escape, as the absence of pain after catheterisation demonstrates.

If the method fails and there is difficulty in removing the catheter (this never happened in the cases reported) no harm is done; in fact Finney suggests that it is probably better to leave the catheter in place before proceeding to open operation. Traction on the catheter by an assistant during the operation will then simplify identification of the ureter and calculus.

SUMMARY

Attention is drawn to a simple and effective method of extracting a small recently impacted ureteric calculus.

The principle of the method is gradual ureteric dilatation through intermittent traction on a ureteric catheter made to form a loop which grips the stone.

In 50 cases reported elsewhere by Finney, no complication of any kind was encountered.

One of three personal cases illustrating the method is described.

I wish to thank the Medical Director-General of the Navy for permission to publish this article.

WELFARE EQUIPMENT DEVELOPMENT ASSOCIATION.—An association of manufacturers and distributors, under the chairmanship of Mr. Tudor Davies, was set up at a meeting held in London on Dec. 6. The speakers included Dr. R. A. Galway, who suggested many ways in which the association could coördinate the efforts of manufacturers and the needs of welfare officers. The acting hon. secretary of the association is Mr. A. E. Hinds, 61, St. Paul's Churchyard, EC4.

MIDGE CONTROL IN SCOTLAND.—The scientific advisory committee of the Secretary of State for Scotland has appointed a subcommittee under the chairmanship of Brigadier F. A. E. Crew, FRS, to deal with this problem. The members are: Mr. A. E. Cameron, D SC, Mr. J. A. Downes, Mr. Guy Morison, Prof. A. D. Peacock, D SC, and Mr. A. J. Purves (secretary), Department of Health for Scotland, St. Andrew's House, Edinburgh, 1.

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Medical Societies

BRITISH ORTHOPÆDIC ASSOCIATION

THE annual meeting of the Association was held in London on Dec. 15 and 16, under the presidency of Mr. ST. J. D. BUXTON. On the second day there was a discussion on amputations and limb-fitting at Queen Mary's Hospital, Roehampton.

VASCULARISATION OF MUSCLES

Prof. W. E. LE GROS CLARK said it is well known that most muscles are supplied by two or more main blood-vessels, and injected specimens show clearly that their branches effect a number of anastomotic connexions inside the muscle. But such material gives no real indication of the adequacy of these connexions for the establishment of a collateral circulation; nor does it tell us whether interruption of one of the main vessels (or of one of their intramuscular branches) may lead to a localised ischæmia severe enough to be of practical importance. These problems have been studied in rabbits by the ligature of blood-vessels supplying muscles, the results being assessed partly by subsequent histological examination, and partly by using a highly diffusible dye, bromo-phenol blue. This dye rapidly colours all normal muscles after intravenous injection, and is of particular value for assessing the physiological efficiency of the circulation, since it indicates the degree of interchange between the capillaries and muscular tissue even when a feeble circulation in the main blood-vessels may, in fact, be still present. The efficiency of the anastomotic connexions was found to vary considerably in different muscles. In some, such as the tibialis anterior, ligature of one of the vessels of supply leads to a sharply defined area of ischæmia. For example, two days after ligature of the lower vessel of supply to the tibialis anterior, intravenous injection of bromo-phenol blue stains the upper half of the muscle to a normal intensity, but the lower half remains almost entirely unstained, and the boundary between the two areas is sharply defined. The normal vascularisation of the lower half of the muscle is not restored for about a week. If both of the main vessels supplying the tibialis anterior are ligatured, revascularisation is delayed for a fortnight. In experiments in which small steel ball-bearings were shot through the adductor muscles of rabbits at velocities of 250–1000 metres per sec., localised and sharply defined areas of ischæmia were produced, as the result of interruption of the muscular vessels (probably associated with some local vascular spasm). Histological study of the unstained areas of muscle in these experiments showed that most of the muscular tissue had undergone necrosis. The necrotic tissue is removed remarkably quickly by the invasion of granulation tissue with abundant macrophages, and its removal is soon followed by the regeneration of new muscle-fibres. In this way, a large part of the damaged muscle appears to become reconstituted. More experimental work is required to determine whether this regeneration is more than a temporary phenomenon, and whether it leads to the formation of functional muscular tissue. The experiments show that in the muscles of the rabbit there is a remarkable potentiality for regeneration in devascularised tissue, and that, in spite of anastomotic connexions, the interruption of one vessel of supply to a muscle (or one of its branches) may lead to a relatively extensive and well-defined area of ischæmia lasting for several days. This is important in relation to the infection of muscles in war wounds.

DENERVATION AND RE-INNERVATION OF VOLUNTARY MUSCLES

Dr. RUTH BOWDEN demonstrated the importance of maintaining function in voluntary muscles denervated as a result of peripheral nerve injury. In such cases atrophy is most rapid in the early stages of paralysis, when there is an increase of connective tissue, associated with wallerian degeneration in nerve-fibres, and obliteration of the terminal Schwann tubes and motor end-plates. Eventually, as muscle-fibres continue to atrophy they are replaced by fat and connective tissue. Finally the muscle may resemble tendon. Up to a year after denervation one may expect a fair degree of functional recovery; nevertheless, the atrophy and replacement by connective tissue starts from three months onwards. The reversibility of the changes in muscle depends on such things as sepsis, age, mobility of the limb, and physiotherapy, as well as on the nature of the lesion in the nerve itself. The electrical changes in denervated muscle are due not so much to degeneration as to atrophy. The more sluggish response to galvanic stimuli is due to the impulse being conducted through muscle instead of through nerve. The response may disappear altogether if atrophy is advanced. Electromyography reveals, for example, changes accompanying fibrillation, which persists as long as any denervated contractile fibres remain, and the special type of action potential noticed during the early stages of re-innervation. This sort of investigation does not give quantitative estimates of the re-innervation, and is not yet completely reliable as a guide to prognosis. Dr. Bowden stressed the value of galvanism in maintaining muscular activity, and in limiting the degree of atrophy. It must be regular, and be started as soon as possible after injury. Contractures which may develop in denervated muscle because of the connective-tissue formation can be retarded by physiotherapy, and may be prevented by daily movements throughout the whole range of the joints of the limb. Splinting of paralysed muscles should never maintain complete immobility.

WAR SURGERY

Lieut.-Colonel E. A. MACNAUGHTON, RCAMC, described the technique of early wound closure and treatment in plaster of ten compound fractures of the femur. His report dealt not so much with the immediate primary treatment—excision of the wounds, and general treatment with blood-transfusions, penicillin, and sulphonamides—but with the next stage, a week or so later. Providing that the primary treatment had been adequate, the thigh wounds in these compound fractures were completely closed, without drainage, at this stage. Closure was accompanied by accurate reduction of the fracture, and where required stainless steel wires or vitallium screws were used in its fixation, without prejudice to wound healing. This fracture fixation was, where suitable, done through the existing soft-tissue wound. Colonel MacNaughton emphasised the importance of adequate preparation of the patients for operation by rest (patients were usually tired from travelling), replacement of blood-loss, further penicillin before and after operation, and avoidance of examination of wounds in the wards before operation.—In the discussion which followed, some diffidence was expressed about the use of metallic fixation in such cases.

Lieut.-Colonel R. ZOLLINGER, MC USA, questioned the value of sulphonamide drugs inserted into wounds. This, he felt, is unnecessary if the primary excision has been adequate. Sulphonamides thus inserted do not penetrate far into crevices, where it is often important to maintain a high concentration of the drugs; this could be ensured only by adequate general administration.

AMPUTATIONS

At Queen Mary's Hospital, Roehampton, Mr. F. G. ST. CLAIR STRANGE read a paper on the *Amputation Stump, in Health and Disease*. The amputation stump must be considered a new and normal organ, on the perfection of which will depend the health and happiness of the patient. The state of this organ should be an evenly truncated cone, having the smoothness of skin and scar mobility which follows first-intention healing, and with no scarring or œdema in the subcutaneous tissues. The stump requires an internal scar, between the cut surfaces and the top surfaces of the flap; normal structure and function of the muscles inserted into the stump; rounding off of the bone end, with its covering layer of compact bone; and the special adaptation of function in the stump to control the artificial limb. To achieve all these, Mr. Strange emphasised the need for an operative technique planned with precise attention to detail at every stage. This must be a plastic as well as an orthopædic operation. The flaps should be rounded, and should contain deep fascia, in order to retain lymphatic, blood, and nerve-supply to the skin.

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There must be minimal trauma of nerves. Bone and periosteum must be cut at the same level. Careful hæmostasis must be followed by artistic skin suture. A neat stump, besides being physiologically sound, gives the surgeon a justifiable sense of æsthetic achievement, and gives the patient a good psychological start to his life as an amputee. "Dog-ears," and other redundancy must be avoided, the flaps just meeting over the end of the stump. Postoperative care must avoid the development of flexion contractures. There must be minimal disturbance of dressings; elastic stump bandaging should be used from the 12th day, to shrink the stump without forming a "waist"; non-resisted exercises should be encouraged from the 12th day, whereas progressive resisted exercises do not begin until 3½ weeks after amputation. With a thorough regime stumps are ready for measuring in 4–6 weeks, and are ready for limb-wearing by the time the artificial limb is made. Throughout the consideration of re-amputation, Mr. Strange emphasised that in spite of the use of penicillin and sulphonamides surgical first principles must be followed—the operation should be approached in the same spirit as, for example, a bone graft for an old compound fracture. One must have an absolutely aseptic field, and adequate time must be left after the healing of the original sepsis before re-amputation is embarked on.

Prof. N. PRIOROV gave a résumé of the experiences with amputations in a large area under his control in Russia. Plaster was applied to the stumps to facilitate transit in cases of primary guillotine amputations in field hospitals. First dressing was never done before the 8th day. Secondary suture of long skin flaps was often done with sutures inserted through plastic buttons, which can be pulled up gradually until closure is effected. The operative techniques were essentially the same as in this country, except that the end of the bone canal is usually tamponed with muscles. Temporary bucket peg-leg prostheses are extensively used.

Mr. GEORGE PERKINS emphasised the importance of the deep fascia and its treatment in providing a mobile scar.

Colonel STOUT, NZAMC, said that in the New Zealand Army all their amputations were left open until the 4th or 5th day, and sutured then; they were expected to heal by primary intention.

Major MATHER CLEVELAND, MC USA, said that the American Army surgeons were told to carry out circular amputations at the lowest possible level. In most cases these were followed by skin traction within a plaster bucket. The soldier was then immediately evacuated to the interior, where definitive treatment was carried out.

Prof. T. P. MCMURRAY asked surgeons not to be hasty in carrying out amputations; even a bad limb of his own might be more acceptable to a man than an artificial one.

Dr. A. J. CRAFT demonstrated all the standard limbs supplied by the Ministry of Pensions.

Mr. R. D. LANGDALE KELHAM, in a paper on amputations in children, stressed the need for making stumps as long as possible, because the stumps of children do not grow as much as their normal limbs.

Colonel REX DIVELEY, MC USA, presented a cinema film, dealing with the life of a man who had two arms amputated and yet attained a high degree of independence.

Major JOHN CHARNLEY, RAMC, demonstrated an adjustable weight-bearing calliper splint, designed on the Thomas principle but suitable for mass-production in a variety of standard sizes, having a ring for ischial bearing which was adjustable within limits for different thigh circumferences, and upright irons which were adjustable for length by a screw-fitting extension. With a suitable supply of basic parts, fitting and supplying such an appliance took an hour or two, compared with the several weeks required for a made-to-measure product.

During the meeting honorary membership was conferred on Sir ALFRED WEBB-JOHNSON, FRCS, and on Mr. J. RHAIADR-JONES, chairman of the executive committee of the Central Council for the Care of Cripples.

Reviews of Books

The Sick African

A Clinical Study. MICHAEL GELFAND, MB CAPE TOWN, MRCP. (Post-Graduate Press. Pp. 357. 25*s*.)

THOUGH not a textbook of tropical medicine, this comprehensive study of African diseases, tropical and other, shows the author to be an acute observer and a sound clinician. The book is designed to help, primarily, those coming into contact with sick Africans for the first time. These at present are bound to be mostly European, since qualified Africans are as yet few. Dr. Gelfand has therefore wisely given a good deal of attention to the differing aspects of disease as they affect Europeans and Africans. These differences are not only physical and clinical, but include psychological and environmental factors. The low level of housing and hygiene, the faulty diet, the long distances to be travelled in search of medical aid, and the scanty funds available for that aid all colour the picture and are especially emphasised in the first two chapters. Dr. Gelfand makes no attempt, however, to arrange his material in scientific order, and the table of contents is somewhat haphazard. The order of the chapters is partly based on the frequency with which a disease occurs; thus the first three chapters are on malaria, bilharziasis, and ankylostomiasis, after which come the usual tropical diseases (or diseases now considered tropical), fevers, venereal disease, diseases of the heart, and of the respiratory and nervous systems, &c. Diagnosis, symptoms, and treatment are given pride of place; pathology is not dealt with in detail, and the book does not attempt to include surgical treatment. The account of the prophylaxis of preventable diseases is rather scrappy, perhaps because Dr. Gelfand thought it outside the scope of the book. Possibly the advent of DDT may make him more hopeful. Nevertheless, the book is likely to become a vade mecum to doctors in Africa, as well as to others who may have to treat sick Africans when no doctor is available.

War Surgery

Lectures by Various Authors. (British Medical Students Association. Pp. 67. 2*s*. 6*d*.)

THE British Medical Students Association invited eight well-known surgeons to address them on some aspect of war surgery, and these lectures proved so popular that it was decided to publish them. Sir James Walton on recent advances, Mr. Tudor Edwards on chest wounds, Mr. McIndoe on facial injuries, and Sir Ernest Rock Carling on burns give summarises of their subjects which will be as useful to the experienced as to the novice. Rear-Admiral Gordon-Taylor contributes an article on surgery in Russia, and Dr. J. Trueta discusses the treatment of wounds in plaster-of-paris. Major-General Max Page, on surgery in the field, had too large a subject for compression into one lecture. Colonel Elliott Cutler gives his views on first-aid in a lecture whose language is refreshingly informal and whose contents show how various snags, particularly in first-aid in American aircraft, have been overcome.

Black's Medical Dictionary

(18th ed.) J. D. COMRIE, MD EDIN., FRCPE. Editor: H. A. CLEGG, FRCP. (Black. Pp. 998. 18*s*.)

THIS popular reference book has achieved a very large circulation since its appearance in 1906, and up to his death in 1939 all revisions were carried out by the author, Dr. J. D. Comrie. It is important that a work so widely consulted by the lay public should be both accurate and up to date: Dr. Clegg has done valuable service in preparing the 18th edition, in which both these objects have been achieved.

The Public Attitude towards Mental Disease

and Urgent Reasons for Early Treatment. (2nd ed.) HORACE HILL, MRCP. (Bennett. Pp. 35. 2*s*. 6*d*.)

THERE are still many members of the public who have superstitious or distorted notions about mental disorder. Dr. Horace Hill has published a brochure which indicates briefly and simply how desirable it is that the relatives of an insane person should not put off admission to a mental institution as long as possible, but should rather obtain for the patient the benefits of early treatment.

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THE LANCET

LONDON: SATURDAY, JANUARY 6, 1945

Who should Feed the Sick?

FOR those engaged in hospital catering the welfare of the patient is seldom the sole criterion of success. Thus in many municipal hospitals food is entirely in the hands of the steward and his clerks, men so well trained to respect public money that they often see economy as a measure of efficiency. In voluntary hospitals responsibility for the patient's diet is usually borne by the secretary or the matron, both of whom must keep in mind other considerations such as cost, the staff of the kitchen, and the work entailed for nurses. Even the best intentions can be dissipated by such division of loyalty, and, in addition, the persons concerned usually lack the special knowledge needed for their task. Consequently, though a few hospitals can fairly take a pride in the meals they provide, they are only exceptions to a thoroughly bad rule.

That this situation has arisen is one of the anomalies of medicine. The earliest hospitals looked to the friends of the patient to bring him food, or else supplied his bare wants out of charity. When convenience made the feeding of the sick a part of hospital care it was still undertaken as a charitable duty, not as a part of treatment. Doctors as a whole never seem to have felt responsible for it. But we have no right to this philosophic detachment, for every day the good results of medicine and surgery are nullified or delayed by failure to apply the most elementary principles of invalid feeding. Those who keep their eyes and ears open will not lack examples—the flatulent "abdominal" who is expected to cope with beans and under-boiled potatoes; the young child given strong tea instead of his accustomed milk; the patient awaiting admission to a sanatorium whose food is so scanty and unattractive that he steadily loses weight; the men at a spinal centre, many with bedsores, whose condition deteriorates on a small, monotonous, and distasteful diet. A large proportion of patients, urged to speak frankly, will tell a story of this kind from their own experience of hospital—people whose standard of adequacy is by no means high. Moreover, studies of diet in hospitals show that, even in some of the most famous, the patient cannot expect to get the full sugar and fat rations to which we are all entitled. The hospital, faced with the task of getting sick people back to work quickly, is often less careful for their proper nourishment than was Lord WOOLTON, tightening their belts for war. Moreover, improper social distinctions have crept into hospital feeding. Thus officers may have good food at the expense of other ranks in the same hospital, who do not always get enough, and "surplus" rations from the public wards may be used to make sweets and puddings for the private patients' supper. This sort of thing cannot possibly be justified. Rations leave no margin for generosity to the well-to-do.

That food should be unattractive is bad enough: that it should be insufficient is a failure which as doctors we should never have countenanced. From these defects it follows that in many cases the diet, instead of supporting treatment, is in active conflict with it; and that the patient only begins to derive full benefit from the care of his doctors after he has gone home. True the science of dietetics is still young; but HIPPOCRATES and GALEN long ago knew well enough what weight to give to regimen. In letting the feeding of patients develop along such casual lines we have been negligent and irresponsible; and however difficult and inconvenient it may be to change existing customs we must see that this is done. It is a task for the heads of the profession: registrars, junior medical officers, and newly appointed dietitians have not the power or influence to correct the errors and inadequacies which they witness daily. Often the dietitian who tries to enforce her recommendations finds herself directly up against nursing or administrative interests. It is for those whose voices carry weight on the governing body of the hospital to insist on reorientation.

A feasible plan of reform was put forward more than a year ago by King Edward's Hospital Fund.[1] This suggested that every hospital should have a permanent food-service committee representative enough to clear the various administrative and professional hurdles—the financial responsibilities of the catering officer or purchaser, the choice and quantity of foods recommended by doctors and dietitians, and the staffing puzzles of the matron. The attitude of the finance department has important repercussions on food. Some of the apparent economies of today—such as the inexpensive cook—may be false economies financially as well as medically. Thus the Fund records that in one large hospital where the wages of the entire kitchen staff amounted to £1000 a year, £20,000 a year was spent on food until a more experienced staff was engaged, at twice the wage; then—thanks to expert buying, checking, costing, and cooking—the total expenses fell by £6000, while the diet improved. The type of kitchen staff who are willing to work for low wages are not as a rule those who have an intelligent interest in diet; and monotony, bad cooking, and a tendency to do everything the easiest way characterise the stupid cook, whether she works in the hospital kitchen or in her own home. Buying, like cooking, is a task for an expert. Matrons and housekeeping sisters have seldom had specific training in it, and in any case are never given financial control. Secretaries and stewards may have experience of its financial side, but not of its dietetic implications.

It is not yet possible for every hospital to appoint a qualified dietitian with experience of catering, and give her a free hand; for there are only 271 dietitians in the country. Dietetic diploma courses are offered by four bodies—King's College of Household and Social Science, the Royal College of Nursing, Edinburgh Royal Infirmary, and the Glasgow and West of Scotland College of Domestic Science—all of which require students to take a course lasting a year or eighteen months, including six months' practical training in the dietetic department of a recognised hospital. This practical work is largely in the diet kitchen and wards, for first-hand experience of

1. Memorandum on Hospital Diet, 1943. 6*d*.; and see *Lancet*, 1943, ii, 673.

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large-scale catering is not at present considered essential for the diploma; so the British Dietetic Association suggest that in future new diplomates should make a point of gaining such experience before taking appointments. But reforms need not wait for the training centres to turn out enough dietitians to go round. Mrs. BEETON took no degree in housekeeping, and FLORENCE NIGHTINGALE was not an SRN. Probably in every hospital there are one or two people with the character and initiative to change the picture if they once became infused with the crusading spirit, if they knew a little more, and if they could come by the necessary power. That it would take very little to rouse them was evident from the attendance at a refresher course in catering arranged by King Edward's Hospital Fund in May of this year. Invitations were sent to all the voluntary hospitals in the London area, and 65 of these sent some 150 representatives, including secretaries, matrons, stewards, assistant matrons, dietitians, catering officers, housekeeping sisters, and cooks. They were ready and anxious to learn.

What is needed then? Modern equipment, certainly; and more cooks and dietitians as soon as we can make them: but above all, champions with authority. In every hospital some or all of the medical staff should be backing this essential reform with their might. Good diet is as necessary to recovery of health as good nursing, surgery, or medicine, and it is folly to pretend that it is beyond the power of our profession to change this reproach. It has been created through our indifference and idleness and must be removed by a bit of hard work.

Arterial Advances

IN 1919 Sir GEORGE MAKINS, FRCS, published his red-faced book which tells the story of gunshot injuries of the blood-vessels in World War I. A more thorough study could not be imagined, and the opinions there expressed have held fast, for they were based on close factual observation. Subsequent writers on vascular surgery have leaned heavily on MAKINS for their inspiration, though the years between the two wars have seen great advances. Particularly important have been the clinical studies on the behaviour of peripheral vessels under normal and abnormal conditions. A new era of "physiological" vascular surgery began with the development of sympathectomy, and the early optimism has given place to firmer knowledge of its indications and limitations. The isolation of heparin opened up a new field by bringing one hazard of vascular work—thrombosis—under control. Then came the sulphonamides and with them a real hope of controlling that other hazard—sepsis. War provided the opportunity to test these advances, and the experiences of five years are reviewed and applied in a new memo on arterial injuries, produced by a Medical Research Council subcommittee under the chairmanship of Sir THOMAS LEWIS.[1] Marked "for beginners," it has nevertheless been packed with much sound advice that should be absorbed by all.

Most surgical textbooks do not give us the simple clinical details of what happens to a limb when its blood-supply is cut off. This is lucidly described in the memo, which sets out the principles of treating the partially or completely divided vessel and the subsequent care of the ischæmic limb. Special vascular centres have now been established in Britain, and it is important to transfer suitable cases to these centres early, so that full physiological observations can be undertaken. The memo is not concerned with the later complications of vessel injuries, such as the arterial or arteriovenous aneurysm. These partial lesions have not been common in this war, for the destructive force of the modern missile tears and disrupts the surrounding tissues and thus prevents the imbrication of overlying layers necessary for the hæmatoma formation which is an essential preliminary to the development of an aneurysm. Moreover, there is often gross destruction of the collaterals as they run in the muscle and bone; and the extent of this damage, rather than reflex vascular spasm, is now regarded as the main factor deciding the onset of gangrene. The memo points out that a femoral artery injury, if associated with damage to the femur, is almost invariably followed by gangrene and is an indication for primary amputation. Popliteal vessel injuries too have acquired a sinister reputation in this war. Ligature, however, has not always been followed by gangrene. Thus if a small splinter divides the vessel the adjacent tissue injury is usually slight and ligature may then be successful. But where the missile is of fair size the local collaterals are certainly destroyed and gangrene usually follows. LE GROS CLARK [2] has recently demonstrated experimentally that the missile may also throw the arterial collaterals along its track into spasm. The memo advises that the vessels should be ligatured as close as possible to the site of division, excising of course the contused ends; more remote ligature deprives the limb of important muscular collateral branches. HOLMAN [3] disagrees, declaring that the large artery—especially the brachial or femoral—should be ligated between the main collateral branches and the intervening segment excised. He maintains, on experimental grounds, that part of the force of the stream is otherwise wasted in the blind end and the pressure in the collateral vessels will be found slightly reduced. Such slight falls in pressure are not, however, in themselves significant, for experimentally the pressure in the distal segment of the divided vessel may fall to a third of the systolic pressure (from 110 to 40 mm. Hg) and yet there be no interference with the recovery of the distal limb circulation.[4] That vessels should not be ligatured in continuity has been stressed time and again. The strangling effect of such ligature, and the "battering" of a fixed point in the stretched vessel, are likely to lead to necrosis and sloughing. It is difficult to convince the beginner of this, for he will believe that a terminal ligature runs the risk of being kicked off by the vessel's pulsation. As HOLMAN [5] has stressed, when

1. Arterial Injuries: Early Diagnosis and Treatment. Medical Research Council War Memo No. 13. HMSO. Pp. 24. 4d. The Vascular Injuries Subcommittee of the MRC War Wound Committee consists of Sir Thomas Lewis, FRS (chairman), Air-Commodore Stanford Cade, FRCS, Sir Ernest Rock Carling, FRCS, Mr. S. M. Cohen, FRCS, Prof. J. H. Gaddum, SC D, Surgeon Rear-Admiral G. Gordon-Taylor, FRCS, Major D. Ll. Griffiths, FRCS, Prof. J. R. Learmonth, FRCSE, Mr. B. C. Maybury, FRCS, Prof. J. Paterson Ross, FRCS, Dr. D. S. Russell, Lieut.-Colonel H. P. Simmons, FRCS, Prof. E. D. Telford, FRCS, and Dr. F. H. K. Green (secretary).

2. Le Gros Clark, W. E. BOA meeting Dec. 15, 1944, reported in this issue.

3. Holman, E. *Surg. Gynec. Obstet.* 1944, 78, 275.

4. Charnley, J. *Brit. med. J.* 1944, i, 716.

5. Holman, E. *Surg. Gynec. Obstet.* 1942, 75, 183.

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the vessel is divided there results a gap between the ends, and the force within the vessel is spent in stretching the relaxed elastic wall, so little strain falls on the actual ligature site. There is some difference of opinion as to the ligature material to be used, and the memo make no particular recommendation. MONT REID [6] brought forward good evidence that fine silk, doubled or more, was to be preferred, but with careful primary surgery catgut has on the whole served well. Vessels have, of course, their crucial points of ligature, and at times, especially in the "cold" aneurysm operation, it may be possible to select the ligature site. DE TAKATS [7] has drawn attention—and so does the memo—to some of the more suitable points for subclavian, axillary, and popliteal ligature.

Ligation puts the onus on the collateral circulation, which expands and repairs itself more rapidly than we used to imagine. To maintain the ischæmic tissues alive during this stage of repair is therefore the fundamental in treatment. The memo sets out clearly the management of such a limb. First and most important is attention to the patient's general condition; the limb circulation appears to be rationed until the general condition improves. The memo recommends blood rather than plasma for transfusion, and plenty of it. The need to damp down the metabolism of the ischæmic limb by resting it and keeping it cool is now well apprehended. But there is less agreement on the measures for "forcing" the collateral circulation. The value of sympathetic block is debatable; although as a preliminary to operation for the arterial aneurysm, where the collateral circulation is already established, it certainly has a place.[8] Ligation of the main vein at the same time as the artery is recommended, without enthusiasm, in the memo. There has been a trend against it, and surgeons in the Middle East and the *Field Surgery Pocket Book* regard the evidence in its favour as "not convincing." WILSON in 1933 [9] also concluded that the "supposed benefits of venous ligation have not withstood experimental trial." But MAKINS'S vast experience cannot be ignored, and especially on the other side of the Atlantic such vein ligature is favoured. REICHERT'S [10] ingenious animal experiments showed that if all the tissues of a limb are divided except the bone, artery, vein, and nerve, and then sutured, by the seventh day the artery and vein can both be ligated without precipitating gangrene, whereas if only the artery is ligated gangrene will follow unless the ligation is delayed until the fourteenth day. Such collateral vessel damage closely mimics the conditions in gunshot injuries.

In war surgery arterial ligature obviously has its limitations, for to tie the vessel when there is extensive collateral damage is to court gangrene. Re-establishment of the main arterial stream is our obvious ideal, but end-to-end suture, as the memo points out, is rarely feasible, since excision of the devitalised ends leaves an enormous gap. Besides, such patients have usually lost much blood, and the heat of battle is scarcely the time for delicate vascular work. Other methods are being tried, some as yet in the experimental stage. The memo refers to the work of BLAKEMORE, LORD, and STEFKO,[11] who devised 'Vitallium' cannulæ through which they threaded segments of vein taken either locally or from the saphenous vein. The vein is turned back like a cuff over the ends of the cannula, which are then inserted into the ends of the divided vessel. Blood thus circulates through a vein-graft without being in contact with any metal. Experimentally this method has been particularly successful even without heparin, and it has been carried out in the presence of deliberate mild sepsis.[12] In dogs it was possible to amputate the limb, refrigerate it for 24 hours, and then restore the circulation again by this method. It has been successfully used on a child with a divided brachial artery. The cannulæ are now issued to the American Army, and we understand they have had one successful case already. Those who have tried them declare, however, that the cannulæ are difficult to manage, and the technique is not as easy as it appears. In animals SPIEGEL, FRIEDLANDER, and SILBERT [13] have used the distal end of the divided vessel as a means of autotransfusion, and thus maintained the life of the limb until the collateral circulation was restored. There are several problems to be answered before this method can be applied to man. We do not yet know how much blood such a limb should receive, though we know that it must be only a fraction of the normal or anasarca soon develops. The extracorporeal oxygenation of venous blood also deserves further study, for it may enable us to maintain human limb preparations and thus pave the way for controlled human vascular experiments. The memo recommends the temporary use in selected cases of the Tuffier cannula with heparinisation. This will tide the patient over while his collateral circulation is developing, and will do much to prevent the onset of gas-gangrene in the distal ischæmic limb. Such heparinisation is of course only possible if there are no other gross injuries. With the control of wound infection now possible an entirely new field of vascular work has been opened up—the delayed repair of the vessel. In 1940, after animal experiment, MURRAY and JONES [14] advocated the use of glass cannulæ (and air-raid experience has shown how inert glass is within tissues) as a temporary measure to bridge the vessel gap. They suggested that the patient could then be heparinised and transferred to a better equipped hospital for vessel repair. MURRAY,[15] in his Hunterian lecture in 1939, showed that experimentally heparinisation enabled a vein graft to be used to bridge a gap in an artery, and he recorded successful vein-grafting in man. This operation has been carried out in the Canadian Army on two cases, temporary cannulæ being replaced by venous grafts on the third day. It is particularly pleasing to note that the MRC have taken on themselves the responsibility of collecting and evaluating such advances for the multitude of surgeons.

6. Reid, M. R. *Surg. Gynec. Obstet.* 1934, **58**, 287.
7. De Takats, G. *War Med.* 1943, **3**, 291.
8. *Lancet* editorial, 1944, ii, 443; Learmonth, J. R., Richards R. L. *Ibid*, 1942, i, 383.
9. Wilson, W. C. *Brit. J. Surg.* 1933, **20**, 393.
10. Reichert, F. L. *Bull. Johns Hopk. Hosp.* 1931, **49**, 86.
11. Blakemore, A. H., Lord, J. W., Stefko, P. L. *Surgery*, 1942, **12**, 488.
12. Cabled information (not published).
13. Spiegel, R. Friedlander, M., Silbert, S. *Surg. Gynec. Obstet.* 1943, **77**, 162.
14. Murray, G., Jones, J. M. *Brit. med. J.* 1940, ii, 6.
15. Murray, G. D. W. *Brit. J. Surg.* 1940, **27**, 567.

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NHS or NHI+?

SOME two months ago a group of Conservative MP's headed by Sir ARNOLD GRIDLEY suggested in the *Times* that immediate steps towards a National Health Service should be limited to the organisation and distribution of hospital and consultant services, with extension of medical benefit to the dependants of those people already covered by National Health Insurance. This view is of course shared by many doctors, as was clearly shown in subsequent correspondence as well as at the Panel Conference and the annual representative meeting of the British Medical Association. Many who have long demanded these two reforms, and have had little encouragement from Government quarters, are understandably suspicious now that the Government, sweeping aside their suggestions, propose much greater changes. They would like to see their first two steps taken first, and only after that advance is made and consolidated would they be willing to contemplate more radical alterations. Indeed, Sir FREDERICK KAY MENZIES, from his great experience of medical organisation, argues that progress by stages is necessary because it will take at least 20 years to evolve an efficient service for the entire population—an interesting commentary on the care the public now receive.

The opposing view has been expressed by the *Times* itself and by the Tory Reform Group of MP's, writing on Dec. 22. Briefly this view is that the limited reforms proposed would only be of interim value: as they could not provide a health service capable of fulfilling the demands of the social security plan, they would soon have to be superseded by a more comprehensive scheme; and the difficulties of introducing them would be so little less than the difficulties of the wider scheme that it would be wasteful of time and energy for the Government to do otherwise than plan and negotiate for a comprehensive and universal medical service from the first. The medical profession as a whole has not yet perhaps sufficiently appreciated that a large extension of medical services is necessary to the working of the kind of social security legislation now in prospect. The Tory Reform Group make this point emphatically when they say:

> "We cannot contemplate the payment of benefits on a substantial scale to all who have lost their earning power through sickness or industrial accident or disease unless the claim is backed by a doctor's certificate and unless medical attention, including whatever is necessary in the way of specialist or hospital treatment and rehabilitation, is provided in order to restore earning power at the earliest possible moment. To limit these advantages to the present beneficiaries of National Health Insurance and their dependants neither simplifies nor improves the white-paper proposals."

Even extension of this system to provide a specialist and hospital service would involve wide administrative alterations. As Mr. HUGH LINSTEAD remarked on Tuesday, extension of the panel would raise the same problems as the larger scheme, "with the disadvantage that you are committed to use old machinery."

However there need be no fear that the experience of insurance practice over the last thirty years will be overlooked when negotiations begin. The BMA have chosen among their 16 representatives on the Negotiating Body no less than 14 members with long practical experience of general and insurance practice: in fact, 8 of them belong to the present Insurance Acts Committee, and of these Dr. H. G. DAIN and Dr. E. A. GREGG probably have greater detailed knowledge of the history and practice of NHI than any other two men in the profession. If the guidance of our representatives is heeded it is likely that the new service, whatever its final framework, will retain all those attributes of the panel system that have been found fairest and best both for the patient and doctor. The Tory Reform Group urge their Conservative colleagues not to embarrass the Minister of Health by making restrictive proposals, but allow him "a fair field in which to negotiate with the appointed representatives of the profession." The time has come when the profession, with confidence in its negotiators, should exercise similar restraint, reserving critical suggestions until more is known of the ways in which the Government are willing, or can be persuaded, to modify the white-paper proposals.

Annotations

UNRRA AND NORTH-WEST EUROPE

"THE hungry sheep" of the liberated countries "look up and are not fed," and many people here are beginning to ask the reason why. Before the Allies invaded Europe the Germans were in the habit of telling the occupied countries that though they might dislike conditions under the Reich, they would still more dislike being liberated. In the strictly material sense, thanks to the disruption of modern war, this may have proved true.

Since UNRRA is ostensibly the relief organ of the United Nations, it is being widely blamed for the present state of affairs. Most of the critics, however, do not understand the political and administrative limitations on UNRRA'S power to act, or the practical difficulties involved—above all in transport. As a correspondent points out on p. 28, before UNRRA can provide relief in any country, two conditions must be fulfilled: it must be invited to operate by the government of the area, and (during the so-called military period of relief) it must also be invited by the military authorities. Today, if the governments of, say, France and Belgium ask UNRRA for supplies, all that UNRRA can do is to refer them to the Civil Affairs division of Supreme Headquarters Allied Expeditionary Force (SHAEF). Responsibility for the present situation thus rests squarely on the military, just as it did in Madagascar, Syria, North Africa, and Italy, before UNRRA was created. Faced with criticism, the military answer is that the critics are evidently unaware of the shortages of shipping, of ports and port installations, and above all of inland transport in the form of usable roads, railways, locomotives, rolling stock, and lorries. These shortages make it impossible to supply both the armies and the civil populations. Even stores required by the Forces, it is said, are held up at the arrival ports through lack of transport—of which a modern army never feels it has enough, still less a surplus.

As regards supplies in large quantities, such arguments are no doubt valid. It probably is impossible at present to raise, for example, the calories of Belgian heavy workers substantially above the 1600 they now get daily, or to import the coal and raw materials for want of which industry is standing idle. But such considerations do not apply to the small quantities of medical supplies urgently needed in certain areas. If it is true that people are dying in one area for lack of an amount of insulin which could be carried in a suitcase; if in other areas there are towns without a single bandage; if the essential medical supply needs of Belgium could be satisfied by one transport plane a week, or one trawler a

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month, then such small amounts of transport should be made available, either to Civil Affairs or to UNRRA. We suspect that such matters are overlooked or postponed just because they are so small, and that a man thinking in terms of shells for an army is not likely to see the relative importance of a package of insulin. Moreover, the objectives of Civil Affairs and UNRRA are not identical. The primary aim of Civil Affairs is to prevent civilian problems from hampering the armies: the primary aim of UNRRA is to provide relief. Now that the armies are handing over to the French Government complete control of the *zone intérieure* of France, it should be possible for UNRRA to begin its own work of relief even on a small scale. But it must be given the small but essential transport facilities required.

PREGNANCY TESTS

THERE are now three tests for pregnancy which depend on the demonstration of an increased quantity of chorionic gonadotrophin in the urine. It is hard to know what names to use for them. Reference to the animal employed may lead to confusion—the "mouse" test sounds all right, but the "rabbit" test is often misheard as the "rapid" test, and as for the third, the animal is strictly speaking neither frog nor toad, and "xenopus" sounds rather pompous. The use of eponyms is the commoner practice, though the names Aschheim, Friedman, and Hogben are frequently misspelt.

The Aschheim-Zondek test has already proved its reliability, and for many years Professor Crew was able to report a very low percentage of error with it from the Edinburgh Pregnancy Diagnosis Station. Almost every step in the procedure, from the preliminary weighing of the mice to the diurnal injections, the gassing, and the dissection and mounting of the ovaries, can be left to the trained technician, and only the inspection and reading of the ovaries need be undertaken by the director of the station. A big colony of mice, or a reliable supplier, is essential. By using 5 mice for each test, the occasional refractory animal is virtually eliminated, and false positives should be rare provided the weight, and therefore the age, of the mice has been carefully checked. The great disadvantage of this test is that it takes 5 days to perform.

The Friedman test, which is now almost as well known, is perhaps more suited to the smaller laboratory than to the pregnancy diagnosis station. Small numbers of doe rabbits need to be kept in stock and each strictly segregated not only from bucks but from other does. The intravenous injection of the untreated, or simply filtered, urine demands some technical skill which is acquired by practice. Results may be read in 48 hours. The test animal can be eliminated as a possible source of error. A preliminary laparotomy will allow inspection of the ovaries before the test is begun; 48 hours after injection of the urine for diagnosis another laparotomy may reveal the characteristic corpora lutea and hæmorrhagica of a positive test, or it may reveal no change in the appearance of the ovaries. Injection of a known urine of pregnancy will now make sure that the individual rabbit will respond to chorionic gonadotrophin, and that the appearances found after the second laparotomy were those of a true negative test. This procedure, while bestowing on the test a high degree of accuracy, renders it unsuitable for use on a large scale.

The Hogben test has the great advantage of speed, and only those familiar with pregnancy diagnosis tests will appreciate how important that is. A woman, content to have missed her period by many days, will suddenly decide that she must know at once whether she is pregnant or not. Xenopus will give her the answer within a day. For some years difficulty was experienced in this country with the Hogben test because it was impossible to breed the animals. This difficulty has now been overcome. There is nevertheless one serious disadvantage to the test—if untreated urine or alcohol-precipitated extract is injected, it kills 15% or more of the animals. Preparation of the urine to make it less lethal is an elaborate process depending on the adsorption of the gonadotrophin on kaolin, but in a pregnancy diagnosis station this can of course be carried out on a a large scale without seriously inconveniencing the organisation. It is advisable to kill animals not showing extrusion of ova overnight, for in some cases ova are found in the oviducts on post-mortem examination and an apparently negative test may prove to be positive.

From each of these three standard tests an accuracy of about 98·5% may be obtained provided a detailed technique is developed in the hands of experienced workers. The Friedman test is suited to the small laboratory with a qualified research-worker who will conduct most of the steps of the tests himself. The Aschheim-Zondek and Hogben tests are more suited to the pregnancy diagnosis station, where such manipulations as multiple injections of animals and chemical preparation of the urine can be placed in the hands of trained technicians, the reading of results being alone left to a qualified director. Under such conditions minor variations in technique assume less importance.

NUCLEAR TISSUE

THE basis of practically all histology is the use of stains which distinguish the nucleus from the cytoplasm. By this device the minute structure of the whole body has been made out, and the sequence of changes which the nucleus undergoes in cell division has been observed. These are matters of common knowledge to most of us, however long ago we may have taken our final MB, but within the last 25 years the irrepressible biochemists have greatly disturbed this quiet little medical backwater. Their achievements, recently reviewed by Davidson and Waymouth,[1] now constitute an important development in medical science.

The nucleotides are the basis of all nuclear structure and there are, broadly speaking, two kinds. Both contain a purine or pyrimidine base, a carbohydrate and a phosphoric acid group, but they differ in that in one the carbohydrate is desoxyribose and in the other ribose. This apparently minor structural change confers considerable functional differences on the nucleotides. Those containing desoxyribose condense into molecules with molecular weights of upwards of 1,000,000, and are characteristically found in the nuclei of cells. The others condense less readily and are found mostly in the nucleolus, the cytoplasm, in cells without visible nuclei, and in viruses. Nucleotides containing ribose and adenine act as co-enzymes in cell respiration, and it is interesting to recall that two of the B vitamins—riboflavin and nicotinic acid—also enter into the composition of these enzyme systems.

Ribose nucleotides are broken down by an enzyme which has now been isolated and crystallised. This enzyme is heat-stable—i.e., it is not destroyed at 100° C—and it has been prepared and utilised to differentiate the two kinds of nuclear material in cells. Within the last 8 years a method of "staining" nuclear material has been introduced by Caspersson of Stockholm. The purine and pyrimidine bases absorb ultraviolet light much more intensely than any other cell constituents, and by using this light and photographing the cells through quartz lenses the distribution of nuclear material and alterations in its concentration can be followed. Both these techniques have contributed greatly to our recent knowledge, but there are other contributors, one of them being the ultracentrifuge. By this instrument macromolecular complexes can be

1. Davidson, J. N., Waymouth, C. *Nutr. Abstr. Rev.* 1944, **14**, 1.

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isolated. The nucleic acids form just such complexes with other cell constituents, and proteins and phospholipins have been identified in them. Some of the infective agents, such as the virus of the Rous sarcoma, have been shown to contain these phospholipin complexes, but they are not confined to such material and were first isolated from embryonic tissue. Methods of separating the nuclei from the cytoplasm by mechanical means have also been devised, and these enable the nuclei to be subjected to analysis, not only for proteins and nucleic acids, but also for minerals.[2] The structure of the nucleoproteins is analogous to that of some of the oxidising enzymes, and it is tempting to picture them acting in some such capacity in the cell. They are, however, characteristically associated with self-reproducing systems or agents such as genes and viruses, and it is in conferring this property upon a tissue that they appear to exert their major rôle. It has been suggested that the ribonucleic acids enable the cytoplasm to grow and reproduce itself.

One of the problems still to be solved is the metabolic relationship of the ribo- to the desoxyribo-nucleic acids. Mitchell, working at Cambridge, believes that ribonucleotides accumulate in the plasma of rapidly growing cells, and that these are then changed into desoxyribonucleic acid and deposited in the nuclei, which reproduce themselves at cell division. This is an interesting suggestion, but the conversion involves the reduction of the ribose and the methylation of a pyrimidine base. Neither of these reactions has been shown to occur in vivo, but both are inherently possible. This must await further investigation, but meanwhile knowledge of fundamentals is rapidly accumulating, and with any luck some of it will be of direct value to therapeutics.

BRACHIAL NEURITIS OR HERNIATED DISC?

UNTIL about ten years ago it was generally believed that sciatica was due to sciatic neuritis or radiculitis, a form of interstitial neuritis almost equally familiar in the upper limb as brachial neuritis. Now most experts agree that sciatica is usually caused by a herniated intervertebral disc, and it is not surprising that this discovery should have aroused fresh interest in brachial neuritis. Is that long-accepted diagnosis based upon an equally insecure pathology? On another page Major Elliott and Major Kremer report 8 cases of brachial pain which they attribute to herniation of a cervical intervertebral disc. They describe a fairly clear-cut clinical picture which hitherto would probably have been labelled brachial neuritis. But it appears to be more difficult to establish the presence of a herniated intervertebral disc in the cervical than in the lumbar region. In Elliott and Kremer's cases the composition of the cerebrospinal fluid was normal and Queckenstedt's test yielded no evidence of spinal block. The X-ray changes described appear for the most part to be those of spinal spondylitis, which may or may not be associated with a herniated disc, or may even produce similar symptoms. Myelography with 'Pantopaque,' when this is generally available, may make the diagnosis more certain, as in the 3 cases of this series in which it was used. Elliott and Kremer's work will help towards the recognition of one cause of brachialgia and so indirectly clarify the diagnosis of other causes.

Experience with herniated lumbar discs has shown that it takes a considerable time to assess the results of various methods of treatment and arrive at a suitable routine. Elliott and Kremer are wisely conservative. Immobilisation, either by rest or by a plaster jacket, has proved its worth in the treatment of lumbar herniations, and the same principle seems applicable to the far more mobile neck. Paradoxically, manipulation may also be effective. While theoretically this procedure involves a risk of producing compression of the cervical spinal cord, the risk must be very slight, for many patients with "brachial neuritis" have had their necks manipulated without disaster and sometimes with benefit. The indications for surgery have yet to be determined: Elliott and Kremer did not think it necessary for many of their patients, and we must remember that most patients recovered from sciatica and brachial neuritis before a surgical cause was suspected for either, and that the mortality-rate of both is lower than that of laminectomy for herniated disc.

2. Williamson, M. B., Gulick, A. *J. cell. comp. Physiol.* 1942, **20**, 116.

STRESS FRACTURES OF THE FIRST RIB

IN examining 55,451 routine chest radiograms in Royal Naval personnel, Alderson[1] has discovered an unexpected anomaly of the first rib in 35 cases. The site of the lesion was constantly just proximal to the scalene tubercle and the appearance varied from an irregular break, transverse or oblique, partial or complete, to a fusiform swelling of callus or of solid bone. All the subjects were males, no cases being found among the 3433 women examined, and the incidence was highest in the 15–20 age-group; 30 of the 35 were men under 25. Only 5 had significant clinical features or history—2 complained of sudden pain in the shoulder after physical training, 2 recalled local trauma in previous years, and 1 had been carrying heavy weights on that shoulder just before enlistment. In 2 cases serial observation of the repair process showed the early break and later development of callus and bone, with regression of the lesion; and in one a temporary opacity of the lung apex medial to the fracture was originally regarded as tuberculous.

Alderson regards the lesion as a stress fracture essentially similar to those reviewed by Hartley[2] in the metatarsals, calcaneus, tibia, fibula, femur, pubis, and vertebræ; but while these are due to the effects of body-weight, the present lesion is more analogous to fractures of the humerus from chronic overuse. The anatomical facts support this view. The scalenus anterior and medius are inserted into the rib on each side of the subclavian groove, and if these muscles suddenly contract the subclavian artery and lower trunk of the plexus act as a restraining strap holding down the intervening portion of rib at the point where fracture occurs. In this mechanism the first digitation of the serratus anterior and the subclavius may play some part. While fractures of ribs by muscular violence are not rare, the first rib is only uncommonly involved. But this lesion seems likely to be a gradual yielding of march fracture type—certainly not a congenital anomaly, for the line of fusion of primary and secondary ossification centres is well posterior. The frequency in youth and the fact that most of the cases were in men straight from strenuous physical training also fit with an origin in muscular violence.

THE COMPLETE BLOOD SUBSTITUTE

THE discovery in Sweden has been announced of an "artificial blood plasma, capable of use by injection in the same way as real blood transfusion."[3] So far, no precise information has reached this country concerning this contribution to the transfusion problem. No more is known than the broad announcement that the substitute is a derivative of "sugar," named "dextran," which can be produced in unlimited quantities in powder form, while the reconstituted fluid can be sterilised by boiling. These features are of course necessary functions of the complete blood substitute, but it will be clear, even from the scanty facts available, that one or more of other properties, equally fundamental, are likely to be missing. The ideal blood substitute must have oxygen-

1. Alderson, B. R. *Brit. J. Radiol.* 1944, **17**, 323.
2. Hartley, J. B. *Ibid*, 1943, **16**, 255, 348.
3. *Times*, Dec. 8, 1944.

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carrying power, must have a molecule of size sufficient to be retained in the circulation, and should eventually be either katabolised naturally or excreted without detriment. Without oxygen-carrying power, no more than restoration of blood-volume can be accomplished. For this purpose many substances have been successfully used, including pectin, isinglass, gelatin, human albumen, human serum, and (most popular of all) human plasma. It remains to be seen whether dextran has properties equal to natural human plasma.

AMERICAN VIEWS ON CHEST INJURIES

THE views formed by our own chest surgeons in the Middle East and Mediterranean theatres of war[1] were mostly upheld at the July meeting of the American Association of Thoracic Surgeons, now reported. Carter and De Bakey[2] analysed the chest injuries of other wars and showed that out of the total number of men hit on the battlefield the chest was implicated in 25–35%. Most of these cases die immediately because of the severity of their injuries or involvement of vital structures. In the present war, among those who survive to feature as "wounded," chest injuries constitute just over 8% of the total wounds. The present war has seen a real improvement in end-results, thanks to the more general provision of surgery of high standard. In spite of Churchill's[3] comment that the most important achievement of chest surgery in this war is the change of focus from the pleural space to the lung, hæmothorax remains the dominant problem. United States opinion seems to fall into line with British in advocating early and complete evacuation of the blood. This implies needling within the first 24 hours and again almost daily until the pleura is dry. Air-replacement, though facilitating aspiration, has serious disadvantages and should not be countenanced as a routine. Efficient aspiration, apart from relieving any physiological disability within the thorax, such as tension, is an excellent prophylactic against infection, and hastens restoration of pulmonary function. If infection does occur the cardinal principles governing the treatment of empyema must not be overlooked, lest a potentially normal lung ends as a permanently contracted mass against the mediastinum, under a huge chronically infected pleural cavity. The responsibility for sound treatment in the early stages is a heavy one, and the necessity of excluding air from the pleural cavity, both during aspiration and after early operation, is not always realised. In penetrating wounds the chances of air and infection reaching the pleural cavity through a tear or slough in the actual lung substance are appreciable.

The question of conservative or radical surgery in the early treatment of pulmonary injuries seems to have been settled in favour of a fairly conservative policy, once the claims of physiological emergencies and resuscitation have been met. Extensive formal thoracotomies are rarely called for in the early stages unless some definite indication, such as an abdominothoracic injury, is present. But there is a place for modified exploration as an extension of wound revision. Obvious foreign bodies, rib fragments, and blood-clot can be removed, bleeding points secured, and such structures as the diaphragm examined for integrity. Later on, formal operations are mainly concerned with removal of foreign bodies[4] and clot. In addition, when the lung is bound down under a chronic hæmothorax cavity, there is a possibility that the encasing fibrous layer can be removed comparatively simply and re-expansion of the lung facilitated (decortication). The Americans stress the value of intercostal nerve-block with procaine in the early treatment of painful chest injuries, and seem to make more use of endobronchial suction (tracheobronchial toilet) than surgeons in this country. A combination of these methods may have a useful place in the treatment of painful chests, and the prevention of atelectasis and pulmonary consolidation. In spite of the encouraging reports of the effects of penicillin in chest surgery there can be no relaxing of the established principles of surgical treatment in these injuries. One feature of after-treatment that is scarcely mentioned in the American papers is breathing exercises. Over here the efficient and energetic pursuit of specially designed exercises is regarded as an essential part of treatment, and has been found to shorten convalescence and hasten recovery of lung function.

1. d'Abreu, A. L., Litchfield, J. W., Hodson, C. J. *Lancet*, 1944, ii, 197, 265; Nicholson, W. F., Stevenson, C. R. *Brit. J. Surg.* 1944 (special penicillin issue), **32**, 176; d'Abreu, A. L., Litchfield, J. W., Thomson, S. *Ibid*, p. 179.
2. Carter, B., De Bakey, M. E. *J. thorac. Surg.* 1944, **13**, 271.
3. Churchill, E. D. *Ibid*, p. 307.
4. Blades, B., Dugan, D. J. *Ibid*, p. 294.

NEW YEAR HONOURS

IN a world where so many able men and women are working to the top of their bent it is impossible that honours should be bestowed on more than a few of those who deserve them. But at least the long list of medical honours printed on another page recognises distinction in many branches of professional work. Sir Alfred Webb-Johnson, who receives a baronetcy, has been a progressive and vitalising president of the Royal College of Surgeons, combining affection for the past with a sense of the future. Sir Harold Whittingham, appointed KCB, is identified in our minds with the fine medical service of the Royal Air Force, which he has so ably directed since 1941. Of the new knights, Mr. Claude Frankau, as director of the Emergency Medical Services in London and the Home Counties, has borne a heavy responsibility during the past few fateful months. Brigadier L. E. H. Whitby, who, like Mr. Frankau, has distinguished himself in two wars, is now knighted for his services in the development of the sulphonamide drugs. The same combination of enterprise and patience that enabled him to recognise the therapeutic properties of sulphapyridine underlies his success in other fields, including the development of the Army Blood Transfusion Service. Dr. Alfred Howitt, MP for Reading since 1931 and chairman of the Parliamentary Medical Group, is unfortunately retiring from the House of Commons, where he has been a valuable exponent of the medical attitude.

Further afield knighthoods are also given to Colonel A. M. Cudmore, consulting surgeon to Adelaide Hospital and president of the Medical Board of South Australia, and Dr. A. L. Mudaliyar, FRCOG, vice-chancellor of Madras University. In congratulating all the recipients of these tokens of real esteem we hopefully wish them a happier New Year.

TEACHING HOSPITALS

ELSEWHERE we announce the formation of an Association of Voluntary Teaching Hospitals of Great Britain. It is thought that a body with special knowledge of the particular problems of teaching hospitals will serve a useful purpose in any discussions or negotiations arising out of the report of the Goodenough Committee on medical schools.

DR. THOMAS FERGUSON, professor of public health in the University of Glasgow, Dr. R. E. LANE, lecturer in factory hygiene in the University of Manchester, Dr. A. B. STOKES, deputy medical superintendent of Mill Hill Emergency Hospital, and Mr. R. WATSON-JONES, civilian consultant in orthopædics to the Royal Air Force, have been appointed by the Minister of Labour to the national advisory council he has set up under the Disabled Persons (Employment) Act.

INCIDENCE OF DIPHTHERIA.—In the House of Commons Mr. WILLINK stated that according to returns received from all but a few local authorities in England and Wales, 2243 cases of diphtheria among immunised children were notified during the first half of this year, as against 6743 among non-immunised children. The number of deaths among immunised children was 16, compared with 368 among children not so protected.

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Reconstruction

DENTISTRY OR STOMATOLOGY?

C. BOWDLER HENRY, MRCS, LDS

LECTURER IN ORAL SURGERY, ROYAL DENTAL HOSPITAL; STOMATOLOGIST, INVESTIGATION WING, METROPOLITAN EAR, NOSE AND THROAT HOSPITAL

SHALL dentistry become a separate profession like architecture; or shall it be more closely integrated with medicine? In other words, shall it be autonomous or auxiliary? It cannot be both.

This question has become urgent now that an interim report has been received from the Teviot Committee which has been considering how to provide a satisfactory dental service for the whole community.*

THE SEPARATE TRAINING

In the origin of dental training and practice we can see certain features which still handicap progress.

In the first half of last century dental practice was chaotic. Charlatans imposed upon a gullible public; and the medical profession disdained those few of its members who engaged in the calling. Nevertheless there were two sets of reputable practitioners—one composed of qualified surgeons, and the other of craftsmen who had worked up from the mechanical laboratory to the dental surgery. Though they approached practice from opposite directions, both sets saw the need for reform. A small band of surgeons led by John Tomes founded the Odontological Society (1856), drew up a curriculum of dental study (1858), instituted the London School of Dental Surgery with its concomitant charity (1858–59), and successfully petitioned for Parliament to grant the Royal College of Surgeons (1843–59) "power to institute and hold examinations for the purpose of testing the fitness of persons to practise as dentists ... and to grant certificates of such fitness." This is the LDS RCS Eng., the first examination for which was held in 1860.

The object was to establish a course of education for dentists which would be exactly comparable with the medical curriculum in period of study and cultural level. It was to be different somewhat in kind from that required for membership of the Royal College of Surgeons, but not inferior in degree. To give effect to this, two-fifths of the medical curriculum was omitted and in place of the medical subjects purely dental subjects were inserted.

A HYBRID CURRICULUM

The curriculum was designed by a subcommittee of the Odontological Society, and all the members of this committee were surgeons † practising as dentists. But they had to include plate-making in the curriculum, not merely because the adaptation of artificial teeth was a form of treatment which it was necessary for every dentist to know, but also because they wished to leave no part of dentistry outside disciplinary control. Furthermore, there were political considerations. The Odontological Society had a rival in the newly founded College of Dentists, which aimed at making dentistry autonomous and made a strong appeal to the craftsmen. A desire to gain the widest possible support may have been one of the committee's reasons for including so much of dental mechanics in its course of study. Moreover, at this period, though the science was in its infancy, the craft of plate-making, which still involved the carving of artificial dentures out of solid blocks of ivory, was at a high level. In consequence, the curriculum of the Odontological Society as approved by the Royal College of Surgeons constituted a compromise between the infant science and the established craft.

So practical was this curriculum that it remains fundamentally the same today, and all subsequent dental degrees have been founded on it. But in 1944 we recognise that the importance of the science far outweighs the importance of the craft. In the science lies prevention: in the craft there is only reparation, which is the eternal treatment of end-results. It was doubtless expedient to unite the two in 1860, but the offspring of their union is a conflict which has grown steadily and is still with us.

In recent years the status of dental practitioners has been openly discussed and the discontent felt by many has found expression. So far as I know, however, no-one has exposed the underlying cause of the trouble, which is this hybrid curriculum. The founders of the dental curriculum meant it to be equal in degree to the medical curriculum, and different only in kind. The expense and the time occupied were the same, and diplomates in dentistry might reasonably expect to be held in the same esteem as diplomates in medicine. But the part can never be as important as the whole, and it would have been better if training for practice in the part had been made shorter and less expensive than training for practice in the whole.

THE DOUBLE QUALIFICATION

Encouragement to take the full medical qualification has always been given. Speaking some 20 years after the dental curriculum had been in operation, John Tomes, to whose foresight and initiative we owe the dental diploma which he himself largely planned, said:

> "My strong advocacy of special, must not be interpreted as indifference to medical qualifications. I would give every possible encouragement to the attainment of the latter not, however, as a substitute for, but as a supplement to the dental degree. Educationally, the relations of the membership to the dental licence may be regarded in the same light as the relations of the fellowship to the membership are regarded. This view will indeed take effect in certain appointments. In many of our hospitals, although the membership of the College of Surgeons is a full qualification, the governing body require that their surgical officers shall be Fellows of the College. Whenever the Fellowship of his College is required of a candidate—provided the Fellowship implies a higher degree of professional knowledge than the Membership—it may justly be required of the dental candidate for office that he shall possess the Membership in addition to the dental licence of his College."

But for the majority of dental students, while still in their student years, an addition of 6 months to the period of their dental studies, with a further 33 months afterwards for completing the medical course has not been practicable, because of the expense and the delay in becoming self-supporting. Furthermore, many students, lacking proper advice ab initio, have found too late their professional examinations were insufficient to enable them to go forward with a medical course after qualifying dentally; indeed in the past they have had to spend time reverting even to biology or to the examination in general education if they wished to take a degree course.

Thus we find that dentistry as a profession is a narrow cul-de-sac, and most entrants appreciate this too late.

The need for some form of higher examination has been felt by the profession and attempts have been made to satisfy it. But in so far as these introduce specialism within a specialty they are doomed to failure. On the clinical side no degree short of full medical qualification can be regarded as adequate in breadth and depth of basic knowledge.

SEPARATE STOMATOLOGY FROM PROSTHETICS

How then can the practice of dentistry and the training of dental surgeons be altered for the better? In the department of the teeth the natural trend is towards the application of prophylaxis based on biological investigation, such as the influences of heredity and nutrition. For prophylactic measures to be successful, those who apply them should have as complete a basis of biological knowledge as is needed for any other department of prophylactic medicine. It would be best I think to recognise that the present practice of dentistry is out of date, and at least to separate the biological from the prosthetic side.

There are several good reasons for adopting this course. Morally, it is not right that he who condemns a patient to lose teeth should profit by the fitting of artificial substitutes. Ethically, it does not enhance professional status that a dental surgeon should be a party to the sale of goods over the counter—which is how

* This paper was written before the interim report was published.

† The position of John Tomes is unique in that he had been apprenticed (1831) to a surgeon and had been appointed house-surgeon at the Middlesex Hospital (1837) when he became interested in odontology; and he did not in fact take the MRCS until 1859, although he was admitted FRS in 1850.

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the law regards the fitting of dentures. Most important, however, is the need to improve the state of health of the community, which demands that the causes of dental disease should be studied and measures for prevention, ranging from antenatal care onwards, sagaciously applied.

To secure this improvement in dental health we need stomatologists—preferably men who have entered the dental sphere through the broad portal of medicine. I would not by any means exclude those who take a medical qualification after their training in dental surgery, but the approach through medicine certainly gives a man a broader view: he sees the dental structures in their natural place in the general field; he sees that the reactions of dental tissues are those which his knowledge of physiology and histology would lead him to expect; and his springboard for research is fixed more firmly than that of the man whose approach to these biological problems has been pre-eminently through the mechanical rather than the physiological laboratory.

If our goal is to produce many more men with this type of mind, then we must facilitate their training. We must make the specialty of stomatology equal in every respect to the other specialties of medicine, and this can be done only by removing dental mechanics from the stomatological curriculum and placing adaptive dentistry in a separate category of practice, that of dental prosthetics.

The recommendations in the brief paragraph on dental health in the report of the Goodenough Committee are totally inadequate and, since there is no reference to the Interdepartmental Committee on Dentistry, over which Lord Teviot presides, the impression left in the reader's mind is that so far as the Goodenough Committee is concerned, practice in the department of the teeth may still remain in the neutral zone of compromise in which the curriculum of 1860 originally placed it.

A SINGLE BASIC MEDICAL EDUCATION?

In planning the nation's dental services the basis should be the stomatological department of the polyclinic or health centre—not the requirements of private practice, which must be secondary to public treatment. To increase the personnel, and get best advantage from the fully qualified, certain parts of treatment should be delegated to persons specially, but less expensively, trained. This entails the division of professional personnel into categories, and the following are suggested:

(*a*) Stomatologists.
(*b*) Dentists.
(*c*) Dental auxiliaries, such as:

Hygienists.	Radiographers.
Physiotherapists.	Speech-trainers.
Prosthetists.	

Stomatologists would act as consultants to the dentists, and would invariably hold such appointments as (1) advisers to the Crown; (2) heads of dental services or dental branches of medical services in the Forces and similar Government services; (3) visiting dental surgeons (but styled stomatologists) to all hospitals; (4) heads of stomatological clinics; (5) professors, senior teachers and directors of studies and research in university schools of stomatology and dentistry.

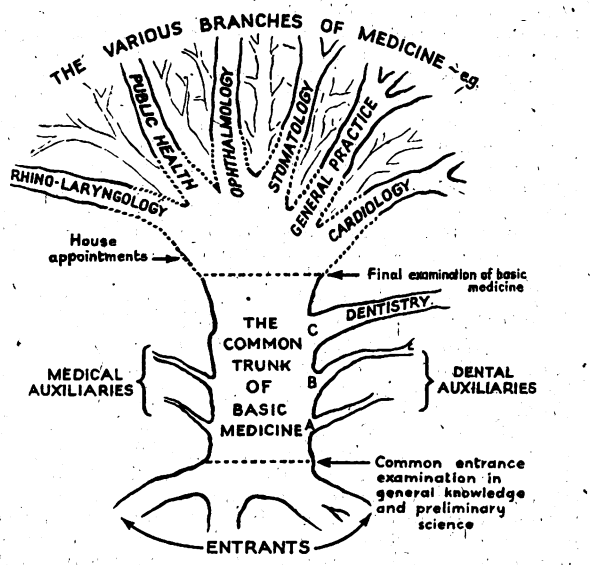
Dentists would carry out the ordinary operations of conservative dentistry—i.e., fillings, extractions, parodontal treatment and orthodontics—subject to the direction, though not necessarily continuous supervision, of the stomatologists. Several dentists could work under the supervisory control of one stomatologist.

In practice the dentists would fit between the stomatologists, to whom they would be subordinate, and the dental auxiliaries, to whom they would be superior.

Dental auxiliaries would carry out their duties under the direction of the stomatologists, with or without the interpolation of the dentists.

A "trunk and branch" system of training should be arranged, so that stomatologists, dentists and dental auxiliaries would receive appropriate parts of the same basic medical education. As stomatology is a specialty of medicine, the stomatologist would have to climb the whole trunk of basic medical study before getting on to his particular branch (see figure). The dentist would leave the trunk earlier; his qualifying examination would be broadly equivalent to the present LDS, but he would have to pay more attention to general and special physiology and pathology and (since all plate-making would be excluded) less attention to dental mechanics. Dental auxiliaries would branch off still earlier—the prosthetists probably sooner than the hygienists but perhaps at the same level as the radiographers and speech therapists.

An essential feature of this scheme is that the highest degrees of medicine should be available to every aspirant



The tree represents a trunk and branch system of a suggested scheme of medical education, in which student auxiliaries as well as those intending to proceed to full qualification take suitable parts of the same basic instruction and examinations. In this scheme stomatology, with dentistry and its auxiliaries, finds an appropriate location.

A = dental auxiliary, e.g. Prosthetist.
B = dental auxiliary, e.g. Hygienist. C = dentist.

ascending the basic trunk: no-one should have to go back to the bottom and start again up some other trunk. For example, a dental auxiliary who left the main trunk at A, if he later wanted to become a dentist should be able to rejoin the trunk again at A and continue his basic studies from A to C. In the same way, a dentist who left at C should be able to convert himself into a stomatologist by rejoining the trunk at C and continuing his climb. Moreover, if a man who has chosen any of the dental branches—from stomatology to hygiene—desires to follow some other branch of medicine, he should be able to rejoin the trunk where he left it and go on with the appropriate courses of basic and special study.

A system of this kind would encourage and assist people of ability to rise from lesser positions to greater ones, and where a man found himself unsuited to dentistry it would enable him to transfer to another kind of medical work. These possibilities of advance or exchange would do much to get rid of the dead-end atmosphere of dentistry and thus increase the number of entrants.

The examinations, from those of the basic education up to qualification, for every grade from auxiliary to medical or dental practitioner, would have to be identical throughout the country. Dental education would be planned by those who plan medical education, advised as at present by a Dental Board, and would remain subject to control by the General Medical Council. It would be essential for medicine to adopt a broader and more understanding attitude towards dental problems than hitherto. Will medicine accept the trust?

NUTRITION IN THE COLONIES.—Under the Colonial Development and Welfare Act, 1940, a free grant of £10,000 has been sanctioned to finance plans to deal with nutrition problems in the Colonies. The money will be spent on the payment of temporary technical staff, the training of staff, and the provision of technical equipment or materials required for experimental work.

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Special Articles

THE TASKS OF UNRRA

FROM A CORRESPONDENT

A WISE old medical superintendent once said that it took two years to make a hospital from the time it was opened or reopened. However good the personnel were as individuals, it took this time for them to learn to work together—subconsciously, to know what was the business of each and which were the duties of others. If this is true of a small unit, how much more may it be true of a large body such as UNRRA? The agreement that brought this organisation into being was signed on Nov. 9, 1943, and the London office was opened only last March. What has it taken on? The provision of:

1. Essential consumer goods for immediate needs, such as food, fuel, clothing, shelter, medical supplies; and materials such as seeds, new materials, and machinery.

2. Essential services such as health and aid in repatriation of displaced persons; the rehabilitation of public utilities (light, water, communications) in so far as they could be restored for immediate needs and to enable a recipient country to produce and transport relief supplies for its own and other liberated territories; and assistance in procuring equipment for schools and universities.[1]

It is understood that, save in exceptional circumstances, UNRRA will take on these duties only in liberated countries. In ex-enemy countries after occupation they will be the function of the military authorities.

In these liberated countries its representatives will be subject to two limitations. First, "the agreement stipulates that the Director-General shall not undertake activities in any area in which the military are operating without the consent of the military command, and that he will be subject to such control as the command may find necessary."[2] Secondly, once a government has been set up in a liberated area, "the Administration would operate only after consultation with, and with the consent of, the government concerned."[3] This second provision is a logical conclusion of the aim of "helping the people to help themselves" which is the signal under which UNRRA has taken sail.

We live in a stricken world, whose recovery will be slow. At the moment we have to keep people alive; and that means food, clothing, fuel, and shelter, with the emphasis on the food. Now there are three things in the problem of food—its provision, its transport, and its distribution. The first two are useless without the third, and this demands the work of many, carriage, and a constant supply. There may be danger of loss between the port of unloading and the mouths of the peasant or the working man. We must face facts, and it would be a grave waste for food to be transported across the Atlantic and unshipped at a European port only to disappear into the black market.

So UNRRA reserves to itself the right if necessary to distribute the relief supplies.

> "Dean Acheson, Chairman of the Council, remarked that UNRRA could not reconstruct the world, neither could it be limited to a mere 'soup-kitchen' charity. The scope of UNRRA, he pointed out, lay somewhere between these two extremes."

This is a true saying; but the soup-kitchen must come first. Without calories to keep their muscles going, the provision of seeds and machinery will be of small avail; and medical supplies can do but little against disease in a starving population.

The other problem that UNRRA has set itself is the restoration to their own homes of all those persons who have been displaced from them. The task is immense. UNRRA is arranging to undertake it both in enemy countries and in those the enemy have overrun and conquered. Nearly all these many people will wish to return on the moment the bugles sing truce, and will shortly be screaming at the "inefficiency" that has frustrated their desire. But alas! it is impossible. The job will take time. And during that time the displaced persons will need food, clothing, and temporary shelter; with which arise medical problems at the present site of habitation, on the journey, and on arrival at the old home. Not least of these will be the mental one; and of that not the least part will be the need to keep them occupied in mind and body, doing their own share for the restoration of the world, without feeling that they are still subjected to the slave labour for which they were originally uprooted.

It may be that UNRRA is not moving quick enough, but immediate returns are hard to produce in so vast a scheme. It may be that we shall shortly see a great acceleration; and this is needed, for many are starving. It is unjust to judge the organisation for lack of results at this moment. But men and women will go on starving until results are obtained.

1. UNRRA. The Story of the United Nations Relief and Rehabilitation Administration. HM Stationery Office. *id.*
2. *Ibid*, p. 5. 3. *Ibid*, p. 9. 4. *Ibid*, p. 8.

MEDICINE AND THE LAW

Criticism of a Coroner

A WRITER, said Fitzgerald, J. (in R. *v.* Sullivan, 1868), may freely criticise the proceedings of courts and of individual judges—"nay, he is invited to do so in a free, fair, and liberal spirit"—but he must write without malignity and he must not impute corrupt or malicious motive. The same distinction was made in 1928, in R. *v.* Editor of the *New Statesman*, between legitimate criticism and such an imputation of unfairness as would justify the court in committing the author for contempt. In a recent libel action at Manchester assizes a coroner complained that a newspaper had gone on to the wrong side of the line; the court, however, took the opposite view and dismissed the coroner's claim with costs.

Somebody, it appeared, wrote to the *Stockport Advertiser* a letter recounting a visit to a Stockport inquest. "If what I witnessed was an example of the manner in which such inquiries are conducted, it is high time that some public protest was raised; a coroner's inquiry is surely an inquiry to determine cause of death and not an inquisition; our British judicature and legal profession are known for the inherent quality of courtesy and fairness." Mr. J. A. K. Ferns, the coroner who was thus attacked, contended that this imputed discourtesy and unfairness to him and insinuated that he ought to be removed from his office; it also exposed him to public ridicule. The newspaper pleaded that what was written was not defamatory but was fair comment on a matter of public interest. Having given evidence in support of his claim, Mr. Ferns was cross-examined with a view to establishing what he stoutly denied—namely, that he had been ill-tempered to a witness, had shouted aggressively at her, and had told her not to mislead the court. There were other witnesses for the plaintiff. One, a former coroner's officer, said he heard no shouting, but in cross-examination seemed to agree that the coroner's manner had been slightly different since the letter was published. Another, a detective officer, denied warning a prospective witness that the coroner was a very peculiar man before whom witnesses must be careful. A third, the caretaker at the public-assistance office, denied that there had been any shouting or bullying. When the plaintiff's case was closed, the judge declined to accept the suggestion made by defendants that there was no libel. The witnesses for the defence were a girl who complained of the treatment she had received when giving her evidence at the inquest, two others who gave evidence on the same occasion, the writer of the letter, a reporter on the defendant newspaper's staff, and the assistant editor who had seen the letter-writer before publishing the letter and had formed a good opinion of his sincerity.

Mr. Justice Stable, who found for the defence, said it was clear that the plaintiff's manner made an unfortunate impression upon people at the inquest. If comment was honest, and not a cloak for private spite or grudge, it was a good thing that people occupying public positions should be exposed to public criticism. The letter was fair comment. "Let me make it plain," added the judge, "that the dismissal of the plaintiff's suit does not mean that Mr. Ferns is not perfectly well qualified to hold his office or that he has not discharged his duties quite adequately for many years or that he is unfit to continue doing so. Many of us would no doubt benefit from a little candid criticism from outside." Mr. Ferns, said the judge, must not take the matter unduly to heart. "After nearly 40 years as coroner

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I am not surprised that Mr. Ferns should get a little testy with witnesses; I have had only six years and I get a little testy myself." Thus the matter ended with honours easy. Evidently the plaintiff failed to establish that the letter went as far as to suggest that he ought to be removed from office; short of that, the writer, if honest in his criticism, had a free hand.

NEW RUSSIAN MEDICAL ACADEMY

THE new Academy of Medical Sciences of the USSR has lately held its inaugural meeting in Moscow. Georgi Miterev, People's Commissar for Health, addressing the meeting, said that the increasing differentiation of medical research had necessitated the creation of this coördinating centre. The immediate task of the Academy will be to study methods of preventing infectious disease, promoting the healing of wounds, and combating wound shock. General Nikolai Burdenko, surgeon-in-chief of the Red Army, has been elected president of the Academy; the vice-presidents are Alexei Abrikosov (pathologist), Mikhail Malinovsky (gynæcologist), and Pyotr Kuprianov (surgeon); and the secretary Vasily Parin (physiologist). The presiduum consists of Alexander Bogomoletz, Hippolyte Davidovsky, Julian Dzhanelidze, and Leon Orbeli. The Academy at present has 60 members, but a further number, as well as some corresponding members, are soon to be elected.

NEW YEAR HONOURS

THE honours list issued on Jan. 1 contains the following names of members of the medical profession:

Baronet

Sir ALFRED EDWARD WEBB-JOHNSON, KCVO, CBE, DSO, MB MANC., FRCS

KCB (Military)

Air-Marshal Sir HAROLD EDWARD WHITTINGHAM, KBE, MB GLASG., LL D, KHP, RAF

Knights Bachelor

Colonel ARTHUR MURRAY CUDMORE, CMG, MB ADELAIDE, FRCS
President of the Medical Board of the State of South Australia.

CLAUDE HOWARD STANLEY FRANKAU, CBE, DSO, MS LOND., FRCS
Director of EMS, London and Home Counties.

ALFRED BAKEWELL HOWITT, CVO, MD CAMB.
MP for Reading since 1931.

Brigadier LIONEL ERNEST HOWARD WHITBY, CVO, MC, MD CAMB., FRCP
Assistant pathologist to the Middlesex Hospital.

Diwan Bahadur ARCOT LAKSHMANASWAMI MUDALIYAR, MD MADRAS, LL D, D SC, FRCOG
Vice-chancellor of the University of Madras.

CB (Military)

Brigadier WILLIAM ROSS STEWART, CIE, MB EDIN., FRCSE, KHP, VHS, IMS

Major-General DAVID TURNBULL RICHARDSON, MC, MB EDIN., KHS, RAMC

Air Vice-Marshal ANDREW GRANT, CBE, MB EDIN., KHS, RAF

CSI

Major-General JOHN SIMSON STUART MARTIN, MB EDIN, KHS, IMS seconded IAMC
DDMS, central command, India.

CMG

HENRY SPELDEWINDE DE BOER, MC, MRCS
DMS, Uganda.

Lieut.-Colonel WILLIAM FRANCIS ELLIS, OBE, MRCS, RAMC retd.
Press attaché at HM Consulate-General, Tangier.

CIE

Major-General WILLIAM CALDER PATON, MC, MB EDIN., FRCSE, IMS
Surgeon-general with the government of Bengal.

Brigadier DONALD MACDONALD FRASER, MB GLASG., IMS seconded to IAMC
Inspector of medical services, general headquarters, India.

Rai Bahadur TRIDIB NATH BANARJI
Principal, Prince of Wales Medical College, Patna, Bihar.

CVO

WALTER GRAHAM SCOTT-BROWN, MD CAMB., FRCS

CBE (Military)

Surgeon Captain THOMAS BENJAMIN DIXON, MRCS, KHP, RNVR retd
Brigadier JOHN STRUTHERS FULTON, MD EDIN., MRCP, RAMC TA
Group-Captain EDWARD CYRIL HENRY FOREMAN, MRCS, RAF

CBE (Civil)

Mrs. MARY GEORGINA BLACKLOCK, MB BELF.
Lecturer, Liverpool School of Tropical Medicine.

HUGH ERNEST GRIFFITHS, MS LOND., FRCS
Surgeon to the Albert Dock Hospital and founder of its fracture clinic and rehabilitation centre.

THOMAS BAILLIE JOHNSTON, MD EDIN.
Sector hospital officer EMS London; professor of anatomy, Guy's Hospital Medical School.

JAMES RÖGNVALD LEARMONTH, CH M GLASG., FRCSE
Surgical director, EMS, south-eastern area of Scotland, and professor of surgery in the University of Edinburgh.

Lieut.-Colonel ALFRED ALEXANDER WEBSTER PETRIE, MD EDIN. and LOND., FRCP
Superintendent, Banstead Mental Hospital.

GEORGE BLYTH WALKER, MB EDIN.
Deputy director of health service, Nigeria.

OBE (Military)

Surgeon Commander THOMAS FRANCIS CREAN, LRCPI, RN

Surgeon Lieut.-Commander EDWARD JAMES STARBUCK WOOLLEY, MB LOND., RNVR

Colonel JOSEPH ALEXANDER BINGHAM, MB GLASG., FRCSE, FRFPS, RAMC

Colonel WILLIAM LOREN FENNELL, MD MANITOBA, MCPS, IMS

Lieut.-Colonel LESLIE FLETCHER, MB GLASG., RAMC

Lieut.-Colonel IAN MORISON ORR, MD, CH M GLASG., FRCSE, RAMC

Lieut-Colonel JAMES ELLIOT SNOW, MRCS, RAMC

Colonel THOMAS JAMES LOGAN THOMPSON, MC, MB DUBL., RAMC

Group-Captain JAMES FREDERICK SANDOW, MRCS, RAF

Wing-Commander RICHARD WHITE BERNARD ELLIS, MD CAMB., FRCP, RAFVR

Wing-Commander THOMAS JAMES MYLES GREGG, MB DUBL., RRAFO

Wing-Commander CECIL WILLIAM KIDD, MD BELF., AAF

Wing-Commander NORMAN RALPH SMITH, MRCS, AAF

Squadron-Leader AGNES LILIAS DOVEY, MB EDIN.

Squadron-Leader JOHN CARY GILSON, MB CAMB., MRCP, RAFVR

Squadron-Leader GEORGE HARVEY DUTHIE, MB EDIN., AAF

Squadron-Leader BASIL GERALD PARSONS-SMITH, MA CAMB., MRCP, RAFVR

OBE (Civil)

ROY MERVYN HUMPHREYS, DM OXFD
Senior physician, Sudan medical service.

Miss WENEFRIDE THOMPSON, MBE, MRCS
St. Luke's Mission Hospital, Lakhimpur, Dribrugarh, Assam.

Lieut.-Colonel KEITH SIMPSON FITCH, FRCSE, IMS
Deputy surgeon-general, Famine Relief, Bengal.

Major ALAN ALEXANDER PULLAR, MB NZ, FRCSE, IMS
Presidency surgeon, Bombay.

PETER ALPHONSUS CLEARKIN, MD BELF.
Government bacteriologist to public hospital, British Guiana.

ARTHUR EDGAR DE CHAZAL, MS LOND., FRCS, MRCP
For public services in Mauritius.

ANASTASIOS GAVRIELIDES
Consulting surgeon, medical department, Cyprus.

MBE (Military)

Surgeon Lieutenant MALCOLM JOHN MAY, MRCS, RNVR

Surgeon Lieutenant ALASTAIR WILLIAM SMITH, LRCPE, RNVR

Major AVVAKTANAND, IAMC

Captain HANNAH BILLIG, GM, MB LOND., IMS

Lieutenant KOLLEMPARAMPIL EAPEN EAPEN, IAMC

Captain OLIVER GARROD, MRCS, RAMC

Major THOMAS THEODORE SCHOALES HALL, MD BELF., RAMC TA

Major EDWARD WATSON HART, MB CAMB., MRCP, RAMC

Major ANDREW DEREK KELLY, MB DURH., RAMC TA

Major ABDUL HAQUE MALLICK, IAMC

Major WILLIAM D'AUVERGNE MAYCOCK, MD MCGILL, RAMC

Major EDWARD JAMES PELL, IAMC

Major VERNON DONALD VAN SOMEREN, EAAMC

Major DEREK JOHN WIGGINTON, MRCS, RAMC TA

Squadron-Leader EMMIE DOROTHY FENWICK, MRCS

Squadron-Leader ATHOL GEORGE RIDDELL, MB LOND., RAFVR

Flight-Lieutenant GEOFFREY HALE, MB CAMB., RAFVR

Flight-Lieutenant JAMES HARPER, MB EDIN., RAFVR

Flight-Lieutenant GWILYM MURRAY JONES, MRCS, RAFVR

Flight-Lieutenant ALEXANDER SKENE, MB EDIN., RAFVR

Flight-Lieutenant HAROLD GEOFFREY WOLSKEL, MRCS, DRCOG, RAFVR

MBE (Civil)

SHARAT SHASHI KUNDU, MB
Officiating civil surgeon, Manipur State, Assam.

RAMIRO CAUCHI INGLOTT
DMO Malta.

WILLIAM CECIL WIGAN, MRCS
For welfare services in Nyasaland.

Kaisar-i-Hind Gold Medal

PERAKATHU VERGHESE BENJAMIN
Medical superintendent, Union Mission Tuberculosis Sanatorium, Arogyavaram.

NORMAN MACPHERSON, MB LOND., FRCS
Surgeon, United Missions Hospital, Vellore, and lately doctor-in-charge, Afghan Mission Hospital,-Peshawar.

Colonel HENRY EDWARD SHORTT, CIE, MD, D SC ABERD., IMS
Inspector-general of civil hospitals, Shillong, Assam.

Lieut.-Colonel FRANK TOMISMAN SIMPSON, MC, MB DURH.
Lately MO in the Bihar coalfields.

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In England Now

A Running Commentary by Peripatetic Correspondents

IN Pongo-Pongo, a Pacific atoll, where a number of young Anglo-Saxons are marooned to pursue their celibate calling, there is one small school of thought that holds that, if sanity is to be retained, an occasional "drunk," "blind," or other period of anæsthetisation is obligatory. Some of this school carry out their view with cold-blooded forethought, others only after a struggle with the gods of civilisation, but they all point out that unbelievers become thin and lank, querulous and censorious. If one calls the agencies by which these periods of unconsciousness are obtained by those bad little words "gin" and "rum" there is something gross and unpleasant about this view, but if one called them, say, di-thio-hic-alcohols or gave them a formula with a lot of CHs lolling round in a circle with possibly an S trying to butt in from outside and a P or so in the wing, then the matter could be studied with interest. After all, among the lowlier Brethren of the Lamp, the deciduous trees stay blotto for half the year, the dormouse and the squirrel hibernate, and even that arch-priest of progress, Man, must spend anything from a quarter to a third of his life inert, asleep. True, the Bosun Bird never seems to sleep at all, but he dies young and serve him right. It's all very well for you people in England to look down your noses at this brutishness, but with you book-covers do not go mouldy in a week—even the vulcanite of one's tobacco pipe can grow a mould on Pongo-Pongo—nor are you for ever jeered at by the imprisoning surf. You have your varied interests and that delightful form of atavism, feminine companionship. Moreover, of course, you do—and I write especially to say I hope you did—go back with one accord, all of you, at a stated time, to a childlike and gastric world, to a spell of happy communism, to a day of early legend and song, when only that which is lovely in the past is remembered and the future promises to glow and grow in sunshine: in short, from this coral speck—curse it—go nostalgic hopes that you have all had a very happy Xmas. (As there are no Xmas cards on P-P, please imagine a Robin, rampant; a Xmas pudding plus holly, couchant; and a bottle of Bass, charmant.)

* * *

It was nice of THE LANCET to give us a round game in the Xmas number! Take 500 girls, pencils, and bits of paper and ask them the following questions: (1) *How long do you like to sleep?* Not, mark you, "How long do you usually sleep?"—a very different pair of pyjamas. (2) *Are you a heavy, light, or medium sleeper?* These words may mean different states to different people, nor am I convinced that the sleeper herself is a good judge of the question. (3) *Do you wake in the morning fresh or heavy?* This may depend on what preceded sleep, the state of the bowels, or whether the boy has written lately as well as the quality of the sleep. (4) *Do you ever dream?* Of course everybody dreams, as any "non-dreamer" can demonstrate if he puts a pad and pencil by his bed and conscientiously tries to jot down his transient memories of sleep—and does this for several months. "Do you ever dream?" is really asking, "Before or after being unconscious are you ½ or ⅝ or ⅞ unconscious?" But to put these haphazard answers to ill-framed questions into the scientific apparatus of tables and subject them to statistical analysis is pure nonsense. You might just as well ask, "Which do you like best, Joad, mince-pies, or the smell of onions?" and draw weighty conclusions from the answers; nor is the result more impressive if you append a long bibliography including Mrs. Beeton, Middleton on Onions, and Joad on Joad. I once knew a man who kept tadpoles in a priceless Chinese vase and also a youth who made toffee in a valuable silicon flask in the lab. but this... It's like putting a cough-cure picture in a frame meant for an "old master," it's...

* * *

Trying to run a lab. in India is bad for the arteries. Last week I discovered that my assistant had suddenly decided to use double quantity of CSF for sugar estimations without making any corresponding change in the calculation. She was obviously surprised that I found this course of action strange; yet she must be intelligent, or she couldn't keep a sari from falling all over the floor in ungainly folds, as they seem to do when English girls try to wear them. I interviewed a havildar who had spent eight years in a biochemistry laboratory, and two years in a clinical side-room. Feeling rather ashamed at asking anything so simple, I said, "How do you estimate blood-urea?" After a little thought, he replied, "Estimation of urea in blood. Take benzidine and acetic acid...." I stopped him quickly, asked him if he had done many, and was quite relieved when he said "No," and hinted that his activities in the clinical side-room had been limited to routine urine-testing. I was a bit discouraged by now, but I asked him what he had done in his eight years at the other lab. He said "Vitamins." When I tried to find out which vitamins, he didn't know. I asked what methods he had been using, and he quickly explained that "the doctors" knew what was going on, but he didn't. I pictured him plodding through his daily task for eight years and never once reasoning why; and I thought he perhaps typified one of the reasons why India isn't quite so advanced a country as America or England. The thoroughly westernised Indian will give you the result which he finds; the "native" Indian will give you no result; but the "educated" Indian, the stuff of which laboratory technicians are made, will give you the result which he thinks you want. In this moderately rational desire he is handicapped by an imperfect understanding of what you really do want, and if you suggest to him that you want a "true" answer he is most pained, and thinks you quite unreasonable. Moralising a little, it would seem that intelligence and a keen desire to please are not enough; they must be combined with the ability to face discordant and unexpected facts, the "brute facts" of which our experience is built. This ability is an important part of the "scientific conscience," and until it becomes less exceptional in Indians they will never leave their phantasy-world of political formulæ to enter the sphere of common day.

* * *

Very rarely does it fall to my lot to enjoy the luxury of illness, but when the lower half of my alimentary canal spent a night behaving in that internecine fashion so characteristic of liberated countries I decided to re-establish law and order by spending the next morning in bed, and, for once in a while, to let my patients get well without interference.

Let me hasten to disabuse the minds of townsmen who may fondly imagine that diurnal sleep is easily wooed and won in the heart of the country. It is years since I spent a morning at home and the experience is one that I am not anxious to repeat. The Treasure looked in at intervals to ask if there was anything I wanted. My daughter spent some time strapping a restless pony apparently in the front porch. My elder son devoted the morning to clattering up and down the hall in a pair of heavy boots, an activity which stimulated the dogs to bark. The Treasure, who likes music while she works, accompanies it on the voice, while my younger boy, not to be outdone, prefers endlessly, flatly, and inaccurately to intone the twice-times table. Meanwhile the telephone adds its quota of sound, and the raucous cries of my wife striving to communicate with the deaf gardener evoke a spirit of emulation in the goats.

Next time I lie up I shall do so in an iron-foundry. There is at least a steady sequence about the noises there which I should probably find soothing.

* * *

Recent discussion on postoperative retention of urine has centred on the relative merits of various drugs given by injection. In one hospital the problem seems to have been solved satisfactorily, even in cases of laminectomy, by the postoperative administration (by mouth) of the local brew of cider in doses of ½–1 pint.

* * *

It had been a bad morning. The unhealthily hot and steamy atmosphere of the operating theatre was heavily charged with pent-up emotion. The tonsillar fossa oozed. The tonsillar fossa went on oozing. The surgeon demanded viper venom, a new commodity in those days. A junior nurse retired to the fresher atmosphere of the store room.... Minutes passed and the fossa went on oozing. Says the surgeon to the theatre sister, "How do you expect me to stop this fossa bleeding if your nurses can't even find a simple bottle of viper venom?" He said more than that actually. Says the sister

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promptly, "Try spitting into it." The junior nurse returned, empty handed and apprehensive, to find the theatre atmosphere merely pleasantly hot and steamy.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

THE last three days of parliamentary work before the Christmas recess were inevitably dominated by the serious military situation on the Western front and by the events in Greece. Both have increased the strain on our resources, and because of this growing strain our mobilisation for war effort has been intensified.

The announcement of a new call-up of a quarter of a million men, to be obtained partly from civil life and partly by a comb-out of static units in the Army and from the Navy and Air Force, emphasises the need, while another announcement, that ATS are to be sent abroad in considerable numbers, underlines the effort now required. For the ATS are to be sent to release men for combatant duties. Unmarried women of 21 and over are to be posted in the same way as men, with due regard to the case of those with young children and other special circumstances. But women of 19 years and over will be accepted as volunteers. The Secretary of State for War, Sir James Grigg, said he was confident that this Government decision would be welcomed as a necessary and expansive deployment of available resources. ATS will not be posted, either compulsorily or as volunteers, to Burma or West Africa, and only volunteers will be sent to India.

It is however in these Eastern theatres, as Lord Munster's report shows clearly, that women have a great part to play. The 250 VAD nurses who volunteered for service in India have now been distributed to 20 combined field base hospitals where they are nursing both British and Indian wounded, and both doctors and matrons would welcome an increase in their numbers. The ATS to be sent to India will no doubt play, in their own sphere, an equally effective part. And Lord Munster wants to send out from this country to India a large number of women willing to help in the work of the Red Cross and St. John, Toc H, the Salvation Army, the YWCA, and similar organisations.

Lord Munster's report includes a page on the medical services. The casualties from illness in Burma have been heavy, as is already known from the published figures, and a great drain on man-power. They will not become less while men have to be kept in these unhealthy tropical conditions over a period of years. Malaria, dysentery, and typhus are rife in the Assam-Burma area. Medical services are said to be maintained at a high standard of efficiency, but there are shortages of medical equipment, including refrigerators, fans, and fly-proof netting. Lord Munster achieves a classic understatement when he says apropos of complaints of insufficient and bad-quality food in hospitals—that "Indian cooks . . . unless constantly watched are likely to depart from the highest standards of hygiene." Shortage of medical staff in India, especially of surgeons and trained nurses, persists, despite the arrangements made by the Souttar Committee on their visit to India last year which led to a great increase of Indian medical personnel.

But the strain on medical resources is not confined to India. One way to relieve it is to bring the war against Germany to a victorious conclusion at an early date, and even after that event the demand for the services of doctors for relief work will be considerable. We may however hope that a large proportion of the medical personnel needed in Europe will be provided by the European countries themselves. Some of them perhaps could help us by lending their doctors to the Allied Forces still in combat in other parts of the world.

In anticipation of the new world to come and the probability of an early election the House passed the second reading of the Representation of the People Bill which deals with future elections to Parliament. An Act enabling local elections to be held at early dates received the Royal Assent on the last day on which the House sat. So machinery to review local government authorities and the authority of Parliament itself by a general election will soon be in gear.

FROM THE PRESS GALLERY

Welfare of British Forces in the Far East

IN the House of Commons on Dec. 20 Mr. CHURCHILL said that Lord Munster, who had recently made a tour of India and the Burma Front, had prepared a report which was being issued as a white-paper. A great deal had been done to improve and expand welfare facilities for the British Forces, but clearly more could be achieved if additional resources and personnel could be provided from outside India. The Government would apply themselves energetically to that problem. Their first concern was, naturally, the welfare of the sick and wounded. Lord Munster had visited 34 hospitals and, from a layman's point of view, he was satisfied that the medical facilities were maintained at a high standard of efficiency despite the administrative difficulties of an extended front and poor communications. Lord Munster had drawn attention to certain shortages of medical personnel in India. Every effort was being made to improve the position, but the Government had to pay regard to the many other claims, both civilian and Service, on the available supply of doctors and nurses. Consideration was being given urgently to Lord Munster's proposals, including his suggestion that further members of the Voluntary Aid Detachment should be sent out to India. In some directions, said Mr. Churchill, it would not be possible to achieve what was desired until the defeat of Germany enabled greater resources to be diverted to the East. But plans had been made so that when these resources became available they could be diverted without loss of time to the amelioration of the conditions of service of the men and women of the Forces and the Merchant Navy who were called upon to continue to fight against Japan. Special attention was being given to the provision of a varied diet and up-to-date hygienic systems of preparing and cooking food.

QUESTION TIME

Expenditure on Medical Research

Sir E. GRAHAM-LITTLE asked the Lord President of the Council whether he could give any estimate of current annual expenditure on all branches of medical research in this country, including expenditure by Government establishments, including Service and Supply departments and the Colonial Office, on physiology, pharmacology and pharmaceutical preparations, biochemistry, pathology, bacteriology, nutrition, ophthalmology, ophthalmic optics, clinical medicine and surgery, dentistry, public health and all other questions involved in the promotion of health and prevention of disease; and what approximate proportion of such research was financed or controlled directly by the Medical Research Council.—Mr. C. ATTLEE replied: It is not possible to give any comprehensive estimate of current annual expenditure on medical research in this country, as investigations in this broad field of inquiry are financed not only out of public moneys but also by private funds administered by universities and hospitals and by independent research institutes and organisations. No complete information is available about these latter resources, and only a relatively small part of the total expenditure from funds of private origin is controlled by the Medical Research Council. As regards public funds, the main item is the expenditure of the Medical Research Council, amounting to about £290,000 in the current financial year; of this £250,000 is provided by the Parliamentary grant-in-aid and the remainder from contributions and repayments from various Government departments and sundry credits. The total expenditure directly allocated to medical research through other Government channels is at present about £100,000 per annum, mainly on special investigations by the Services into war problems. This takes no account, however, of research undertaken by the members of medical services, with the Armed Forces and otherwise, in addition to the other duties for which they are primarily employed; nor does it take account of research done by institutions in receipt of Government grants for mainly educational work.

Plans for Women Medical Students

Dr. EDITH SUMMERSKILL asked the Minister of Health whether he could now make a statement on the Goodenough report, including the admission of women students to medical schools.—Mr. H. WILLINK replied: I hope to be able to make a statement early in the New Year.

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Advisory Council for the Employment of the Disabled

The MINISTER OF LABOUR announced that he had constituted his National Advisory Council under the Disabled Persons (Employment) Act, 1944, as follows:

Viscount Ridley (chairman).
Mr. W. P. Allen.
Lieut.-Colonel the Hon. J. J. Astor, MP.
Brigadier-General A. C. Baylay.
Mr. H. L. Bullock.
Major Sir Brunel Cohen.
Captain G. Crawshay.
Mr. A. Deakin.
Mr. E. De Ath.
Chief Commander E. L. Dixon.
Chief Petty Officer L. A. G. Faulkner.
Prof. T. Ferguson, MD.
Lieut.-Colonel H. Rivers Fletcher.
Mrs. M. K. Gartside.
Councillor A. Gilzean.
Mr. I. J. Hayward.
Mr. R. A. Keys.
Dr. R. E. Lane.
Mr. W. A. Lee.
Dame Anne Loughlin.
Major J. C. Poole.
Squadron-Leader W. Simpson.
Chief Officer G. O. Snow, WRNS.
Major-General R. N. Stewart.
Dr. A. B. Stokes.
Lieut.-Commander G. W. Style.
Mr. C. G. A. Ward.
Mr. J. Watson.
Mr. R. Watson-Jones, FRCS.
Lieutenant the Hon. R. F. Wood.
Mr. R. E. Gomme, of the Ministry of Labour and National Service (secretary).

Maternity Accommodation

Mr. W. R. PERKINS asked the Minister whether he was aware that the management committee of the Cotswold Maternity Home, Tetbury, Gloucestershire, had decided to close the hospital owing to the shortage of staff, with the result that 16 maternity beds would be lost to the area and 38 patients who were due to go to this hospital during December and January would have to go to Cheltenham; what steps he had taken to prevent the closing of this hospital; and whether, in view of the industrial activity in the Stroud valleys, he would reconsider his refusal to allow a new maternity hospital to be opened near Stroud.—Mr. WILLINK: I was not previously aware that this maternity home was closing down. I am having urgent inquiries made in conjunction with the Minister of Labour and National Service. I think it better to secure the use of existing accommodation by providing necessary staff than to provide additional accommodation in which similar staffing difficulties would have to be met.

War-time Nurseries

Mr. H. MCNEIL asked the Minister if he was aware that a recent circular of the Ministry to welfare authorities anticipating the closing of many war-time nurseries and curtailing the recruitment and training of probationer nursery nurses had alarmed these authorities; and would he take steps to satisfy the widespread public demand for the continuance of these nurseries on a peace-time basis under post-war housing conditions and for the welfare of mothers and children, in the absence of any provision for home helps, even if the mother was not employed outside the home.—Mr. WILLINK replied: War-time nurseries have been provided at the cost of the Exchequer as an aid to war production. Their purpose has been to enable women with young children to help in the war effort and where these facilities are no longer required their continuance for this purpose at the cost of the Exchequer cannot be justified. I hope, however, that it will prove possible for a number of the war-time nurseries, where the site and the premises are suitable, to be taken over by local education authorities as nursery schools.

Health Services in Ethiopia

Mr. CREECH JONES asked the Secretary of State for Foreign Affairs if he was aware that the Society of Friends ambulance unit, which had been providing three-quarters of the medical personnel of Ethiopia, recently gave that government notice of its intention to withdraw because of the increasing difficulties of operation, shortage of drugs, funds, personnel and inefficiency in government administration; and whether, in view of the resignation or non-renewal of 13 of the 30 British subjects who accepted appointments in 1942 as advisers to the Ethiopian government, further steps were being taken by His Majesty's Government to help forward the health and development of Ethiopia.—Mr. A. EDEN replied: I understand that the Friends Ambulance Unit provides about half the European medical personnel at present in Ethiopia and that their intention (of which the Ethiopian government were fully aware) when they first arrived in Ethiopia at the end of 1942 was to remain in that country for one year only pending the organisation of Ethiopian medical services. The unit has now given its devoted services for twice that period, and I understand that the Society of Friends now feel that they should be free to use it elsewhere. As regards the health and development of Ethiopia, these are matters for the Ethiopian government. HM Government in the United Kingdom have, however, an obligation to assist the Ethiopian government in obtaining the services of British subjects whom they may wish to employ in a medical or any other capacity, and in the course of the negotiations for the replacement of the Treaty of 1942 HM Government have offered help calculated to promote the health and development of the country.

Repairs to Hearing-aids

Lieut.-Commander L. W. JOYNSON-HICKS asked the President of the Board of Trade whether he was aware that owing to the shortage of spare parts there was prolonged delay in repairing hearing-aids; and if he would release a greater quantity of an approved quality for civilian use.—Mr. E. H. DALTON replied: I regret that there have been delays in repairs, due in the first place to the heavy and increasing Service demands for valves, and in the second place to the fact that some manufacturers, contrary to the advice of the Board of Trade, have made new sets with valves needed for repairing old ones.—Lieut.-Commander JOYNSON-HICKS: Is anything being done to improve a situation which the Minister recognises is so bad?—Mr. DALTON: We are looking at it from every direction, but skilled labour is very short.

CANADA

(FROM OUR OWN CORRESPONDENT)

THERE were 350 applications for registration in the faculty of medicine of the University of Toronto this fall, and 150 were provisionally accepted. These will be subjected to an aptitude test, and low grading in this test is held to be an almost certain prediction of failure at some stage of the course. Such students are advised to enter on some other line of study.

A peripatetic correspondent in THE LANCET (Sept. 9) protests against the idea that one man should have the authority to say who should or should not study medicine. Canadian universities have never been threatened by anything like this. Committees of faculty make the first selection, largely upon standing obtained in school examinations set by provincial departments of education. The revelations of the aptitude test are not before them. There is no opportunity for students rejected by the committees to display any aptitude they may have, which might conceivably be greater than that of other students chosen because of academic proficiency in high school.

Students of theology in many colleges are tested as to the validity of their "call" to preach. The aptitude test is the nearest approach we have to a means of selecting the "called" in medicine from those who have been deceived by some other noise. That being so it would seem desirable to apply it to the whole group of applicants, the final selection being made from the most promising candidates.

The large number of young people applying for registration in schools of medicine indicates that a medical career is at present very attractive. A qualified physician is almost sure of a good living and his wife enjoys social prestige. These attractions are likely to fade somewhat should the practice of medicine come under state control as is threatened all over Canada. Should this happen the selection of students will be simplified: the undesirables, however brilliant, will not apply.

The Principal of Queen's University in his annual report noted that after many years of exclusion women students have been admitted to the course of medicine. Two are in the first year and two with advanced standing are admitted to the second year. In Toronto 36 women have been given provisional registration in the first year, but many others have been rejected. Information is not available from other universities but there appears to be a definite trend towards the study of medicine by women. A Russian visitor expressed himself as amazed that the proportion of women to men in medical schools in Canada was so low. Dr. George Draper of New York spoke to the Royal College of Physicians and Surgeons a few months ago and suggested that the urge to study medicine was due to a preponderance of the gynic element in the androgynic mosaic of personality. Should that be so it is quite logical to argue that women, who must necessarily have such a type of personality, are peculiarly suited to the practice of medicine.

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Letters to the Editor

IN WHICH WE MIGHT SERVE

SIR,—You lately quoted with apparent approval, as though it were self-evident truth, a paragraph from a *Times* leader to the effect that the profession cannot expect a substantial share in administering and determining the form of a national medical service because the public will be compelled to pay £30 million a year to doctors in this service. Self-evident it may seem to the *Times* but surely, Sir, it should not seem so to you.

The public pays much more than £30 million a year for its naval service; but though the First Lord is a civilian and Parliament holds the purse-strings I have always supposed that the administration of the Service was very largely in the hands of professional sailors, that the Board of Admiralty consisted mainly of admirals, and that it had powers far exceeding those of the central advisory council proposed to assist the Minister of Health. When Parliament and the public have asserted their powers, overridden professional advice, and settled for themselves the kind of naval service they would like to have, as they did in the 1920's and early 30's, the results have been unfortunate not only for the Navy but for the country, and indeed for the world. But at other times we have a Service of which we are justly proud, and in which succeeding generations of sailors are themselves proud to serve.

Our national educational service, on the other hand, is run very much as is proposed for the medical service, not by teachers but by a Ministry and local authorities. It is at least arguable that it is the most vitally important of all our services, yet I cannot remember ever to have heard a teacher, a pupil, or a citizen express pride in it, or assert, as we do of so many of our institutions, that British State education is the finest in the world.

I believe myself that a people with a clear vision of its own highest good would think long before doing anything to reduce the number of its citizens still able and willing to assume direct and undivided responsibility for the work they undertake; but, without looking so deep or so far ahead, is it not abundantly clear that if the public desires a medical service of which both they and those who serve in it can be justly proud, and in which sons will follow their fathers, they will be wise to take as their pattern not county-council schools but the Royal Navy?

Hampstead, NW3. LINDSEY W. BATTEN.

SIR,—With the greater part of your leading article of Dec. 16 I am in agreement. But you take the white-paper view that "executive powers of this kind can be vested only in elected representatives of the public." Now why? The Services for fighting the King's enemies dispose of large sums of public money which we are forced to contribute even if conscientious objectors; the executive authority is, for instance, the Air Council, a body consisting of a majority of professional airmen, and a minority of civil officials including two elected representatives, the Minister and his under-secretary. Why can't the service for the fight against disease be run the same way?

SERVING OFFICER.

*** Most certainly the medical profession should have a large share in building any new service, and an effective voice in its administration. But technical skill does not confer on its possessors the right to control services provided by the public for the public. Such services cannot be run by elected representatives of the medical profession, responsible only to the profession; for in a democracy control must ultimately rest with elected representatives of those who find the money—either locally through local authorities, centrally through Parliament, or both. Doctors must of course take part in administration of a medical service, just as admirals, generals, and air marshals take part in administering the fighting services. But in every kind of Government department the technician is employed by the Minister and acts in his name.

In the Service Ministries the technician may seem to be able to take decisions and give orders more directly than in the Ministry of Health, and there are undoubtedly differences between the Service and civilian departments in this field. But they are not as unlike each other as is often imagined. In the Ministry of Health there is now a large medical department carrying on a great deal of day-to-day work into which the administrative officers do not normally enter, while for other purposes the doctors and administrators work side by side and the administrators take responsibility for decisions affecting the Ministry's public duties. The ultimate responsibility always remains, however, with the Minister, and his chief medical officers have as free and direct access to him as his chief administrative officers. This civilian system has advantages as well as disadvantages. As voluntary hospitals have shown, doctors can achieve excellent results through lay administrators provided both parties are working towards the same end; and under the present régime doctors at the Ministry of Health seldom complain of being frustrated by their lay colleagues. It would, no doubt, be constitutionally feasible to transfer the executive posts in the Ministry to doctors, but this would not mean that the profession was controlling the service. Also it would produce fresh problems; for the Ministry would still have to deal with the Treasury and Parliament, and doctors who have to devote much attention to governmental technique are apt to lose touch with the technique of medicine. A more useful change, in our view, would be to strengthen the medical staff of the Ministry by the addition of more part-time members engaged in active practice.

Emotionally, and in other ways, there is indeed a contrast between one of HM ships and the school or hospital of some backward local authority. Dr. Batten will remember, however, that the social services are only young and poor relations of the fighting services. The public educational and medical services were established mainly to fill, inexpensively, the larger gaps left by private enterprise and charity; and if the nation, declaring war on ignorance and disease, had granted several hundred millions a year to the Ministries of Education and Health, it would probably have secured something more spectacular. These Ministries have only just begun to plan their comprehensive services for the community, whereas the Admiralty, with almost unlimited resources in time of war, has been planning a comprehensive Navy since the days of Henry VIII.

The result of naval planning is superb. But it is also an entirely centralised, strongly disciplined, authoritarian, State salaried service, paying no attention to the opinions of the people on whom it operates, since they are the King's enemies. This, surely, is precisely what we must avoid for medicine.—ED. L.

AMŒBIASIS

SIR,—In the discussion on amœbiasis at the Royal Society of Tropical Medicine and Hygiene on Nov. 16, reported in THE LANCET of Dec. 9, Dr. A. R. D. Adams of the Liverpool School of Tropical Medicine and other speakers referred to what they call the "Liverpool" method of treatment. This treatment is as follows:

> The treatment lasts 21 days. Bismuth carbonate is given daily, 1 drachm three times a day, in water.
>
> *On odd days:* 'Auremetine' capsules, gr. 3, daily; chiniofon retention enema, daily.
>
> *On even days:* Tab. 'Stovarsol' 0·25 g. b.i.d.

In 1926 Sir Philip Manson-Bahr and I conceived the idea of a combined form of treatment, and worked it out on parallel lines, quite independently of, and unknown to, each other. He used EBI by mouth and 'Yatren' ('Quinoxyl,' chiniofon) as a retention enema. My method of treatment was (and is) as follows:

> *On odd days:* one "slipule" of auremetine, gr. 1, three times daily to a total of 10 days.
>
> *On even days:* Tab. stovarsol, 0·25 g. three times a day to a total of 7 days (provided, always, that the patient does not show any intolerance to arsenic); chiniofon retention enema of one litre daily, the first two at 2½%, the last eight at 5%.

In the beginning, I used to give large doses of bismuth, either the subnitrate, as recommended by Deekes of Panama, or the oxycarbonate as practised by the Liverpool School. I have, however, of recent years given this up, as I do not think that it had much effect one way or the other.

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Some time later—I think it was in the early summer of 1930—I outlined my treatment to the late Prof. Warrington Yorke (who was looking after our tropical cases at Liverpool) and I heard later he had adopted it as a standard treatment for amœbic dysentery. I think you will agree that, in essentials, the so-called "Liverpool" method differs little from the treatment used in this Ministry; and that if any name is to be attached to the treatment, it should be that of the Ministry of Pensions, in which I have had the honour to serve for many years.

Manson-Bahr and I seem to have obtained exactly similar results from the two methods of combined treatment, and I can unreservedly support his claim that, while an odd case here and there has relapsed, we have yet to meet a case that has not *responded* to the treatment, if it is given with meticulous attention to detail.

May I also correct the report of my remarks in your issue of Dec. 9? I am made to say that I had encountered numbers of intractable cases of amœbiasis. What I meant to imply was that I was encountering numbers of cases of amœbiasis which were resistant to emetine. Further, that I had tried a number of drugs to influence the concomitant bacterial infection. The only drug that I have found of any use in this connexion is penicillin. As to conessine, I mentioned, in reply to a question by Sir Harold Scott, that I had tried this alkaloid in a number of cases after the last war, but had found it to be without any effect whatever.

Queen Mary's (Roehampton) Hospital. J. GRAHAM WILLMORE.

TRANSFUSION ORGANISATION

SIR,—During the war I have had the opportunity of studying, in the Midland Region, the working of the national transfusion organisation set up by the Ministry of Health, as applied to many hospitals differing in administration and facilities. As a result I feel that more should be known of the well-regulated control maintained by the service over all transfusion fluids and equipment.

The only stable transfusion material is dried plasma. This, effectively sealed, can be stored indefinitely within normal extremes of temperature. In the case of blood, experience shows a maximum life of 14 days to be desirable. Correctly maintained storage conditions are imperative. A small refrigerator should be reserved specifically for blood storage. It is not sufficient to check the temperature from time to time, for variations are frequent. Refrigerators are therefore supplied with a maximum and minimum thermometer which is read and noted at each delivery and collection. At the same time a record of the numbers and condition of all unused blood is made; valuable information is thus afforded to both user and supplier. Permissible temperature variation is + 2° C to + 7° C. Outside this range a raised reaction rate is often encountered, particularly in winter with refrigerators in exposed sites. Sometimes heat is required to prevent temporary freezing, resulting in hæmolysis of the blood.

Liquid plasma, in general use in the early days of the Ministry of Health's service, suffers from major disadvantages, the principal being the inevitable deterioration with storage. Changes like formation of clots and development of granularity are greatly accelerated by low and variable temperatures. An ever-present danger is the chance of infection, also occurring with bottles of distilled water used for dried plasma reconstitution. Careful inspection of all bottles monthly against a strong light is the only satisfactory safeguard. It is dangerous to attempt to differentiate visibly between "granular"-sterile and infected plasma; crystal clarity of both liquid plasma and distilled water is the criterion for use.

A routine for transfusion of blood at these hospitals has been established. Grouping of the patient is carried out, using a macroscopic technique with serum of high titre supplied by the central laboratory. The officer responsible then withdraws the appropriate bottle of blood from the bank and observes that the plasma-cell junction is clearly demarcated and that there is no trace of hæmolysis. Under no circumstances should blood be transfused if it shows haziness or an ill-defined layer. Some bacteria may proliferate even at 4° C, but fortunately hæmolysis is always concomitant; it is therefore essential that a competent person should examine the blood while it is undisturbed in the bank. The common practice of sending a nurse or student for a bottle of blood cannot be too strongly condemned. A cross-agglutination test of donor's cells with patient's serum must routinely be performed with macroscopic examination after 10 minutes at room temperature. Blood and plasma should be warmed to 37° C. before administration—serious consequences have often resulted from over-heating. Partly used bottles must never be retained for later use.

There has been much uncertainty as to the exact potentialities of blood and plasma. The danger of overloading should at all times be stressed. In cases where transfusion is necessary the amount should be judged from the patient's general condition and blood-pressure, and the hæmatological and biochemical estimations, and its effect should similarly be assessed.

Careful records of all transfusion data may reveal weak features in technique both at the hospital and the central laboratory. The principal causes of reactions appear to be giving blood too quickly, and "pyrogens." A useful rate, other than for massive hæmorrhage, is 40 drops per minute, particularly where universal blood is being employed. It is unwise for hospitals to re-sterilise transfusion equipment; reactions have often been due to this.

Regular contact with the officers of the service enables the hospital transfusion officer to obtain advice on technique and procedure and discuss advances in transfusion work. In this way the full implications of the Rh factor have been impressed on transfusion officers and arrangements made for typing and securing Rh-negative blood on special demand from the central station. Investigational and follow-up work on jaundice reactions is also a recent result of this liaison.

My experience brings out two prime needs—that at all hospitals a particular officer must be responsible for transfusion arrangements; and that where possible transfusions should be planned procedures.

Birmingham. HAROLD THWAITE.

MALIGNANT MELANOMA

SIR,—When I saw the gruesome illustrations and alarming title of Miss Tod's paper I knew that we had to expect anxious inquiries from patients with moles on their skin. The paper attracted the attention of several popular newspapers sufficiently for them to publish warnings of the dangers foretold from these blemishes, and it is regrettable that at least equal publicity was not given to the just and commendable criticism by J. E. M. Wigley and R. T. Brain (Nov. 25) which contains evidence that is less inaccurate and certainly more desirable for the public.

Miss Tod's paper attracted attention with the news that a common blemish could by a common treatment be converted into a malignant condition, horrible in appearance and outlook; yet it did not make any real contribution to its successful treatment. Though moles are very common, and malignant melanoma very uncommon, the latter do not all originate in pigmented moles. The primary focus of malignant melanoma may originate at a site without a pre-existing mole; it may not show the pigment; it may be related by the patient to a small wound; and its appearance may not disturb the patient or suggest to the surgeon the grave lesion which calls for drastic surgery. The first indication of its gravity may be the appearance, in the subcutaneous tissues some distance from the primary focus, of one or more small dark spots which may resemble tattoo spots in their seemingly harmless character; for there may be no elevation of the skin over them, and no sign of reaction in the tissues around. Yet even at this stage radium or X-radiation appears to be useless, even when it is pushed to or beyond the limits of skin tolerance, and surgery of the boldest does not appear to be any more successful. I have seen cases in which X-radiation has been the main cause of pain and distress. On the other hand, pigmented moles may exhibit very ugly and suspicious appearances, may have shown evidence of much recent growth, and may have histological features which suggest malignancy, but may yet be cured by local surgical excision.

Even the suggestion that trauma can convert a pigmented mole into a malignant melanoma has not been established. A common site for moles is the beard area:

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here they may be repeatedly and frequently cut with the razor over a period of 40 or more years without producing a malignant melanoma.

When our cancer "experts" can tell us of a cure let them emblazon the cancer with all the horrors imaginable to cause the afflicted to seek the cure; but until then let us avoid publicity, which though it contributes nothing, adds alarm where apprehension already exists.

Edgbaston, Birmingham. JAMES F. BRAILSFORD.

SIR,—Miss Margaret Tod's article was strongly criticised by Dr. Wigley and Dr. Brain. Apart from the statistical and sociological considerations there are two points on which I would like to disagree with the critics.

They do not admit that irradiation offers a useful alternative to surgery, accepting the generally held view that malignant melanomata are not radiosensitive. There is no doubt that many, perhaps a majority, are radiosensitive. In 1937 I developed this thesis in a paper subsequently published in the *British Journal of Radiology* (1939, 12, 327). In the literature there are many cases of undoubted radiosensitivity of such tumours. After three years' radiotherapy I was convinced in 1933 that the generalisation was incorrect because I had seen complete disappearance of malignant melanoma after radiation. In trying to analyse the causes of failure I came to the conclusion that inefficient removal and inefficient radiation could both be associated with subsequent invasion by the neoplasm, along the well-known routes and especially in the skin. Infection and interference with nutrition of even small groups of cells may be factors of very great importance.

Miss Tod's figures show the danger to the patient of inadequate treatment in the first instance, and also show that radiation can be effective.

Whether the malignancy of such tumours can be the result of injury or injudicious treatment is a question which can never be settled, but "a simple excision or one or two applications of carbon-dioxide snow," although not carcinogenic factors, are dangerous in some cases, the malignancy of which may have been unrecognised, and even unrecognisable, without histological examination. From my own experience I can say that less radical surgery is safe if combined with radiation, and also that even fixed inoperable lymph-glands can be successfully treated in some cases by radiation.

I am of the opinion also that overdosage of malignant melanoma such as will produce marked skin changes is in some instances the cause of failure to treats successfully by radiation.

Radiotherapy Dept., London Hospital, E1. FRANK ELLIS.

PLACE OF IODINE IN THYROID MEDICATION

SIR,—The Goitre Subcommittee of the Medical Research Council have summarised the evidence in favour of giving iodine to prevent the type of goitre associated with iodine deficiency, and have urged the adoption of a national policy of iodisation of all common salt for the prevention of simple goitre (*Lancet*, 1944, i, 107). The consensus of medical opinion is against the continued use of iodine in therapeutic dosage once the thyroid has become enlarged, because it hardens the gland; but information is conflicting about the possible therapeutic value of smaller doses over a considerable period.

To obtain information on this point, an investigation was made in two factories (A and B) employing women recruited from the same area. The factories were adjacent but separate; they were under the same medical supervision; and the age-incidence of the employees was similar. The iodine content of the drinking waters used by these women is low and lies between 2·5 and 3·2 μg. per litre.

The incidence of thyroid enlargement among 1276 women examined was:

Factory	Number examined	Number with enlarged thyroid	Case-rate %
A	800	86	10·8
B	476	33	6·9
Total ..	1276	119	9·3

In factory A 83 women, and in factory B 33 women, were enrolled in the experiment as treated and control groups respectively. The women under treatment (factory A) received twice weekly one tablet containing ½ grain of potassium iodide. The tablets were distributed by the welfare supervisor directly to each worker. There was a transfer of women labour to factories in other parts of the country but at the end of six months (February to August, 1944), 46 remained in the treated group and 29 in the untreated. The alterations in the size of the thyroid during the experimental period were:

Factory	Increase	No increase	Decrease	Total
A (treated) ..	21	7	18	46
B (control) ..	15	7	7	29

The appropriate statistical list was kindly made by Mr. W. T. Russell, D SC, to ascertain if the two distributions were different, and it was found that the value of χ^2 was 2·19 and P = 0·36, which indicates that the progress of the disease among women in the two groups was not dissimilar.

The results of this experiment suggest that the place of iodine in thyroid medication is prophylactic, before the thyroid gland enlarges, in areas where the iodine content of the water-supply is known to be low and goitre occurs. They also bear out the view that the amount of potassium iodide given has no adverse effects, and hence indicate that the use of iodised salt as recommended by the Goitre Subcommittee could have no adverse effects either.

Gloucester Aircraft Factory. R. WILSON CAREY, Medical Officer.

DECISIONS IN WAR-TIME

SIR,—In the debate on the Address, reported in your last issue, the Deputy Prime Minister deprecated the holding at the present time of the election of 39 members of the General Medical Council, 7 of whom only are elected by medical practitioners, on the grounds that "the medical electorate numbers somewhere about 65,000. The strain on the medical profession at the present time is immense. The fact is that people do not know where a large proportion of those 65,000 members are. A large proportion of them is overseas. A great many of the other doctors have been moved about the country according to the exigencies of war." Dr. Russell Thomas very usefully directed the attention of the House to the Deputy Prime Minister's argument against present changes affecting doctors and declared that "the rt. hon. gentleman on behalf of the Government has made it perfectly clear that the medical profession cannot be expected to come to any decision on any matter at the present time." The election of 7 members of the General Medical Council is surely a less important matter than the decision of the conditions of future medical practice in this country. I submit, Sir, that the Deputy Prime Minister has shown a more realistic appreciation of the facts as they are than the Prime Minister and the Government, who propose to introduce legislation revolutionising medical practice in defiance of the clear undertaking given by the Prime Minister himself in the House on Oct. 13, 1943, in the following explicit terms:—

> "There is no question of far-reaching changes of a controversial character being made by the present Government unless they are proved indispensable to the war. Another Government might take a different view, but not this one. . . . I certainly could not take the responsibility of making far-reaching controversial changes which I am not convinced are directly needed for the war effort, without a Parliament refreshed by contact with the electorate."

House of Commons. E. GRAHAM-LITTLE.

SMALLPOX AND VACCINATION

SIR,—I should like to reply on behalf of Major Illingworth and myself to the criticisms levelled at our paper (Nov. 25) by Dr. J. P. Marsden.

The paper was not written for experts; neither of us can claim experience in any way approaching that of Dr. Marsden. It was written for the benefit of the many RAMC medical officers who may run up against

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smallpox in some out-of-the-way part of the world where such classics as Ricketts's *Diagnosis of Smallpox* are not available and the only book of reference may be an infectious disease section of some textbook of general medicine. We described 100 cases as we saw them; we agree that many of our points of difficulty would have been resolved had Ricketts's book been available.

In our experience several of the modified cases were in fact clinically indistinguishable from chicken-pox throughout their course. Not having seen 14,000 nor even 1000 cases we had no option but to resort to laboratory confirmation which enabled us to make a correct diagnosis at an early stage of the infection: this is made quite clear later in the paper.

We admit that our use of the word "successful" with reference to the vaccination state was misleading. As Dr. Marsden suggests, the reaction of immunity was taken as evidence of protection among Service personnel at the time this paper was written some 7 months ago. The difficulty of assessing these reactions and the consequent unreliability of vaccination records based on them have been fully realised and have been stressed in our paper. To refer to the vaccination records of 100 cases as "vaccination statistics" is surely an overstatement. We do not wish in any way to assail the protective value of "successful vaccination" as defined by Dr. Marsden. We have merely stated facts from which we were hardly in a position at that time to draw the inference.

Lincoln. W. A. OLIVER.

HOSPITAL PHYSICISTS AFTER THE WAR

SIR,—The attention of bodies responsible for radiological appointments has, on a former occasion, been drawn to the need to ensure that men serving with HM Forces do not stand at any disadvantage as compared with their colleagues at home.

We are now requested to draw attention to the position of physicists at present serving with HM Forces who may soon be returning to civilian life, and some of whom may very well, we trust, become interested in the possibilities of hospital physics as a career.

During the war a number of hospital physicist appointments have been made from among men who, for various reasons, have been directed to work in civilian hospitals, and who have thereby become experienced in the work and have acquired the "hospital outlook" which is so essential for proper coöperation with the radiologist. It would obviously be unfair, if, by comparison, the man who has been serving with HM Forces stood at any disadvantage, and we have reason to believe that the hospital physicists concerned are themselves anxious that this should not be the case.

It is therefore urged that hospital and radiological authorities should do everything possible to help the "return to normal" of physicists now in the Services, and to ensure that war service and lack of special experience is not a handicap in applications for physicist posts. In our opinion his probability of appointment should at least correspond to that which a physicist might have expected if he had remained at home, and not joined the Services, and if necessary allowances should be made for him to undertake concentrated training necessary to bring his knowledge up to date and standard.

The importance of the physicist in radiological departments is now generally recognised—not least by the radiologist—and it is felt that some acknowledgement of this can be made by radiological bodies in attempting to secure a fair deal for their physicist colleagues who have been on Service.

L. H. GRAY HUGH DAVIES
Hon. Secretaries, British Institute of Radiology.

London, WC2. J. F. BROMLEY
Hon. Secretary, Faculty of Radiologists.

SUPPLY OF ANTIMALARIAL DRUGS TO INDIA.—In the House of Commons Mr. AMERY said that 491¼ million tablets of synthetic antimalarial drugs were shipped to India in 1943. The shipments in 1944 to date total 632½ million tablets, in addition to 1000 lb. of totaquina. Quinine stocks in India in April, 1944, were 244,000 lb. Indian pre-war production of quinine was 90,000 lb. a year and is increasing. Pre-war consumption of quinine was about 200,000 lb. a year and of synthetic antimalarial drugs negligible.

On Active Service

AWARDS

CB

Brigadier R. W. GALLOWAY, CBE, DSO, MB, late RAMC

CBE

Colonel J. B. S. GUY, OBE, MB, RAMC

DSO

Lieut.-Colonel P. J. RICHARDS, OBE, RAMC

OBE

Colonel GEOFFREY ANDERTON, MB, RAMC
Lieut.-Colonel F. H. BENTLEY, FRCS, RAMC
Lieut.-Colonel H. D. CHALKE, RAMC
Colonel W. J. F. CRAIG, MB, RAMC
Colonel J. C. GILROY, MRCP, RAMC
Lieut.-Colonel F. G. HOLMAN, RAMC
Lieut-Colonel J. G. JAMIESON, RAMC
Major F. R. LANGMAID, RAMC
Lieut.-Colonel DANIEL MCVICKER, MC, FRCSE, RAMC
Lieut.-Colonel G. B. MITCHELL-HEGGS, FRCP, RAMC
Lieut.-Colonel A. J. PITKEATHLEY, MB, RAMC
Lieut.-Colonel J. K. SLATER, FRCP, RAMC
Lieut.-Colonel D. T. SWIFT, RAMC

MBE

Major H. J. BELL, MB, RAMC
Captain A. P. R. BORROWMAN, MB, RAMC
Major H. W. BURGE, FRCS, RAMC
Major J. M. P. CLARK, FRCS, RAMC
Major G. J. CUNNINGHAM, MD, RAMC
Major WILLIAM DAVIDSON, RAMC
Major D. J. DAVIES, RAMC
Major F. C. HEATLEY, MB, RAMC
Captain M. C. H. KINGDOM, MB, RAMC
Major J. N. MACARTNEY, MB, RAMC
Major I. A. MACDOUGALL, RAMC
Captain M. G. PENDHARKER, IAMC
Major W. L. OGLE, MB, RAMC
Major AARON ORLEK, FRCS, RAMC
Captain F. E. PITT-PAYNE, RAMC
Lieut.-Colonel C. D. PRESTON, MB, RAMC
Captain R. H. R. RENWICK, MB, RAMC
Major J. A. ROSS, FRCSE, RAMC
Major R. A. TENNENT, MB RAMC
Major R. J. TOLEMAN, MB, RAMC
Major B. MCN. TRUSCOTT, FRCS, RAMC
Major R. I. WILSON, MB, RAMC

MC

Major R. A. HOOPER, RAMC
Captain JACKSON BRAHAM, MB, RAMC
Captain E. M. GLASER, RAMC
Captain O. D. MORRIS, RAMC
Captain L. G. MORRISON, MB, RAMC
Captain D. F. O'NEILL, MB, RAMC
Major F. J. G. SLATER, RAMC
Captain T. G. CAMERON, RAMC
Captain J. T. A. LLOYD, RAMC
Captain A. N. MACPHAIL, RAMC
Captain H. D. MOORE, RAMC
Captain J. A. PERPOLI, RAMC
Captain R. D. BARRON, RCAMC
Captain E. E. MILLER, MM, RCAMC
Captain W. F. MACKENZIE, RCAMC

MENTION IN DESPATCHES

Surgeon Lieutenant H. R. GRAY, MB, RNVR

MEMOIR

Captain F. A. S. AUSTEN, who died in hospital in India on Nov. 5, was born at Worthing in 1909 and was educated at Haileybury College. He qualified at the Middlesex Hospital medical school in 1939, and acted for a year as assistant medical officer at the Mayday Hospital, Croydon, till he joined the RAMC in 1940. After some months in England as medical officer of an antitank regiment he was drafted with British troops to India in 1941. He saw service both in the field and in base hospitals and his commanding officer speaks of him as a most conscientious doctor and officer, cheerful and popular with all. Captain Austen was keenly interested in the Boy Scouts and other youth movements.

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Notes and News

MANSON OF TROPICAL MEDICINE

Sir PATRICK MANSON was born a hundred years ago, and a meeting to celebrate that important event was held on Dec. 14 at Manson House, the home of the Royal Society of Tropical Medicine in Portland Place. His famous diary, in which he recorded in great detail all his main discoveries from 1873 onwards, was on view, with the diary which he kept in Formosa in 1866. Portraits of him at various stages of his romantic career gave spirit to a little collection of exhibits of interest to tropical experts—his drawings of the development of filaria in the mosquito, the actual slides showing development of filaria in mosquitoes sent to Cobbold in 1877, and the slides of malaria-infected anopheles sent to Manson himself by Ross.

Sir Philip Manson-Bahr, in an address, told of his father-in-law's birth on Oct. 3, 1844, at the small town of Old Meldrum, near Aberdeen. His father, John Manson, was a man of substance, owner of two farms and manager of the local linen bank. His mother, Elizabeth Livingstone Blackie, a woman of character, was related to the famous explorer. Young Patrick, the second son, spent his boyhood fishing for eels, tickling trout, shooting partridges and playing cricket. At 16, it is said, he went out one day with 40 cartridges and returned with 39 birds and one unspent cartridge. On another occasion, more in keeping with his later interests, he shot a cat on the roof of the neighbouring manse, and extracted from it a tapeworm which he studied assiduously. When he was 15 he was apprenticed to the firm of Blackie Bros., iron-founders in Aberdeen; but he developed curvature of the spine, and with it that tremor of the right arm which many remember as characteristic of him. While he was lying on his back, recovering from this condition, he decided to take up medicine, and with typical energy qualified while still below the statutory age, in 1865.

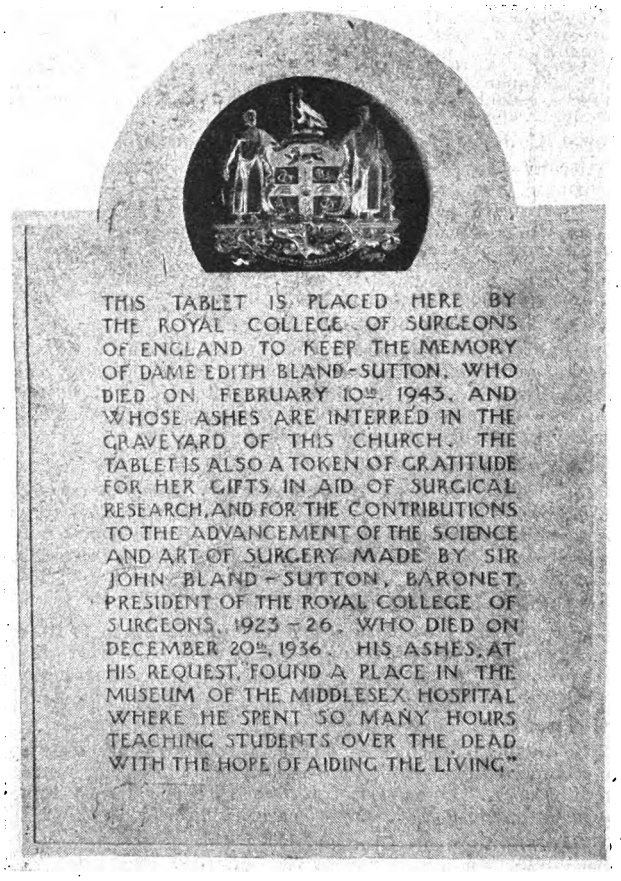
Next year he went to Formosa, where he was port medical officer for 4 years, earning enough to repay his father the cost of his education. He learned to know the head-hunters of the interior, and to speak their language. After a few more years spent at Amey, a treaty port on the mainland, he returned to Scotland in 1875, and married. Stirred by Lewis's work on filaria in Calcutta, he returned to Amoy with his wife and a microscope, and by 1877 had discovered the nocturnal periodicity of filaria. Of his two Chinese assistants, the one who worked at night always found the parasite. "It is the discrepancy which teaches, if you would learn," Manson said. In 1878 he demonstrated the life-history of the filaria in the mosquito, news of which he sent in a modest letter, accompanied by specimens, to Cobbold in London. His study of parasites from that time progressed rapidly. He found *Paragonimus westermanii* in the sputum of a Chinese mandarin, and his discovery of the part played by *Melania libertina* was afterwards confirmed by Nakagawa in 1911. In 1883 he was appointed dean of the Hong-Kong medical school, which he helped to found. Among his first pupils there was Dr. Sun-Yat-Sen, whose life, when the Chinese embassy kidnapped him later in London, Manson and Sir James Cantlie were together able to save.

In 1890 he went home to Aberdeenshire, but in the following year, owing to a fall in the value of the Chinese dollar, he returned to practise, this time in London, where he formed the nucleus of what was to become the London School of Tropical Medicine. His studies of filaria grew and prospered. In 1894, arguing by analogy from what he had observed in filaria, he formulated his mosquito-malaria theory, and acquired the nickname of Mosquito Manson among his colleagues. Ronald Ross, then a major in the Indian Medical Service, got into touch with him, and in a famous correspondence of 58 letters (which Ross thought "as noble a series as ever a man received") the malaria problem was thrashed out. In an experiment designed to convince the British Government, Manson arranged for anopheles infected with benign tertian to convey the parasite to his eldest son by their bites. Patrick Thurburn Manson, then a medical student at Guy's, duly developed the disease.

The London School of Hygiene and Tropical Medicine was opened under Manson's direction in 1899; he retired in 1912 and died in 1922, after some happy years spent mainly in fishing in Ireland. But he was happy in everything he did, absorbedly happy in his work, his sports, in gardening and books—"a great simple soul," as Sir Philip Manson-Bahr called him.

MEMORIAL TO THE BLAND-SUTTONS

THE tablet here illustrated is to be erected by the Royal College of Surgeons of England in the parish church of Ringwould, Kent, which Sir John and Lady Bland-Sutton regularly attended when living at Kingsdown, near Deal. The design is by Mr. Alner W. Hall, FRIBA.


THIS TABLET IS PLACED HERE BY THE ROYAL COLLEGE OF SURGEONS OF ENGLAND TO KEEP THE MEMORY OF DAME EDITH BLAND-SUTTON, WHO DIED ON FEBRUARY 10TH, 1945, AND WHOSE ASHES ARE INTERRED IN THE GRAVEYARD OF THIS CHURCH. THE TABLET IS ALSO A TOKEN OF GRATITUDE FOR HER GIFTS IN AID OF SURGICAL RESEARCH, AND FOR THE CONTRIBUTIONS TO THE ADVANCEMENT OF THE SCIENCE AND ART OF SURGERY MADE BY SIR JOHN BLAND-SUTTON, BARONET, PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS, 1923-26, WHO DIED ON DECEMBER 20TH, 1936. HIS ASHES, AT HIS REQUEST, FOUND A PLACE IN THE MUSEUM OF THE MIDDLESEX HOSPITAL WHERE HE SPENT SO MANY HOURS TEACHING STUDENTS OVER THE DEAD WITH THE HOPE OF AIDING THE LIVING."

A HUNDRED YEARS OF BOOKS

IN his early years of training every medical student in London makes the acquaintance of Messrs. H. K. Lewis's, at the corner of Gower Street; and the friendship usually lasts for life. At one time the welcoming shop was little and dark, like the shop of "wool and water"; of late years it has seemed to grow lighter and larger, but the same odd charm still hangs about it, perhaps entrapped in the characteristic and unforgettable smell of new bindings and printer's ink. Henry King Lewis started in business on his own account towards the end of 1844, in the small shop then known as 15 Gower Street North. He left an organisation on which the whole British medical profession relies. "I should write to Lewis's," we say, when a friend asks for information about a journal or book; "they'll know." Their patience is endless, and their lending library an inexhaustible bran-pie for threadbare student and busy consultant alike. The pleasures of the stationery department, though curtailed at present by paper restriction, can still seduce the busy doctor into loitering, fingering, and planning vast schemes of perfect record-keeping.

Lewis's have lent many of their trained men to the Services—36 are now serving. Those left behind have had to stretch diminishing stock to meet a great increase—not yet explained—in the demand for medical, scientific, and technical books. On their success in this impossible task, as well as on their centenary, the profession will wish to congratulate them.

Society of Medical Officers of Health

A meeting of the fever hospital medical service group will be held at the London School of Hygiene, Keppel Street, WC1, on Friday, Jan. 12, at 3 PM, when Mr. P. G. Shute of the Ministry of Health malaria laboratory will open a discussion on malaria in this country.

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University of Liverpool

At recent examinations the following were successful:

MD—W. I. D. Scott.

FINAL EXAMINATION FOR MB, CH B

Edith M. Brown and D. A. Gregson (with second-class honours).

Part III.—M. K. Alexander, J. T. D. Allen, E. T. Anderton, H. B. Andrews, E. H. Annels, J. P. D. Bates, T. J. Boag, E. Cooper, D. Craddock, H. T. Davenport, K. R. Dumbell, E. D. Edmondson, J. L. Edmondson, I. J. C. Frew, A. Griffith, J. E. Hall, D. A. Harbord, C. R. Helsby, G. Hughes, L. Jacobs, E. S. Jones, H. A. Jones, R. S. Jones, W. T. W. Lawson, S. Lipton, J. B. Lynch, K. McCarthy, M. G. McEntegart, R. H. Martlew, Lucille F. Morgan, D. B. Mossman, C. M. Ogilvie, C. A. Pearson, H. H. Pilling, W. L. Sanders, Isabel S. Smellie, G. W. Storey, P. J. Taylor, W. A. Thompson, and R. D. B. Williams.

Royal College of Surgeons of Edinburgh

At a meeting of the college on Dec. 19, with Prof. R. W. Johnstone, the president, in the chair, the following were admitted to the fellowship:

R. S. Barclay, MD GLASG., Marjorie R. E. Boyd, MD DUBL, R. B. W. Cole, MB DURH., Leonard Goodman, MRCS, S. W. G. Hargrove, MB CAMB., L. W. Hefferman, MRCS, Mary K. Lawlor, MRCS, F. J. Lorriman, MD DURH., Gardiner Mitchell, MB BIRM., D. R. K. Reid, MB ST. AND., and Paul Steiner, MRCS.

British Dental Association

Sir Alfred Webb-Johnson, FRCS, will open the inaugural meeting of the industrial dental officers' division at 13, Hill Street, London, W1, on Saturday, Jan. 13, at 2.30 PM. Speakers will include Dr. R. V. Bradlaw, professor of dental surgery in the University of Durham.

Priority Rations for Invalids

The Ministry of Food is sending every doctor a copy of its new booklet, MED 2, on special rations and allowances for invalids and people on special diets. Extra copies may be obtained from the Ministry's Welfare (Foods) Branch, Mount Stewart Hotel, Colwyn Bay.

Dried Bananas for Adults

Patients with steatorrhœa can now obtain up to 14 lb. of dried bananas a month by applying to their local food office and presenting proof that steatorrhœa is present, including an analysis of the stools for fat.

St. Thomas's Hospital

The medical school has left its temporary premises at Godalming and will reopen in the London building on Jan. 9. The linked St. Thomas's Hospital at Hydestile will continue to cater for most of the inpatient clerking and dressing.

Hygienists for the Continent

The Civil Affairs branch of the Army is asking for the services of a number of medical officers of health to act as hygienists in liberated areas.

Society of Thoracic Surgeons of Great Britain and Ireland

The society will meet in London on Thursday and Friday, Jan. 25 and 26. At 2 PM, on Jan. 25, at 1, Wimpole Street, W1, there will be discussions on constrictive pericarditis, and foreign bodies in the air-passages, and at 10 AM, on Jan. 26, at 26, Portland Place, W1, a discussion on treatment of carcinoma of the bronchus.

The Place of Science in Industry

The British Association, through its division for the social and international relations of science, is arranging a conference on this subject, to be held at the Royal Institution, Albemarle Street, London W1, on Friday and Saturday, Jan. 12 and 13. There will be discussions on what industry owes to science, on fundamental research in relation to industry, on industrial research and development, and on what science might accomplish in the future. The speakers will include Prof. E. C. Dodds, FRCP, FRS, Prof. J. M. Mackintosh, FRCP, Sir Richard Gregory, FRS, Mr. A. L. Bacharach, Sir Joseph Barcroft, FRS.

Association of Voluntary Teaching Hospitals of Great Britain

A meeting of nominated representatives of the undergraduate teaching hospitals was held at the Westminster Hospital on Dec. 7. The 46 present included Dr. H. E. A. Boldero, Dr. W. Russell Brain, Dr. E. ff. Creed, Mr. W. D. Doherty, Dr. F. G. Hobson, Dr. Hugh Gordon, Prof. T. B. Johnston, Mr. G. H. Macnab, Dr. E. F. Scowen, Dr. G. Cochrane Shanks, Mr. Fauset Welsh, and Mr. J. M. Wyatt. The chairman of the association is Mr. J. E. Humphery, chairman of Guy's Hospital, and Mr. B. Lees Read (Guy's Hospital) and Mr. F. J. Cable (Manchester Royal Infirmary) have been nominated as secretaries.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED DEC. 16

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1990; whooping-cough, 1343; diphtheria, 463; paratyphoid, 5; typhoid, 7; measles (excluding rubella), 8985; pneumonia (primary or influenzal), 729; puerperal pyrexia, 123; cerebrospinal fever, 37; poliomyelitis, 5; polio-encephalitis, 0; encephalitis lethargica, 1; dysentery, 201; ophthalmia neonatorum, 7. No case of cholera, plague, or typhus was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Dec. 13 was 870. During the previous week the following cases were admitted: scarlet fever, 58; diphtheria, 22; measles, 43; whooping-cough, 19.

Deaths.—In 126 great towns there were no deaths from enteric fever, 7 (0) from measles, 2 (0) from scarlet fever, 3 (0) from whooping-cough, 7 (0) from diphtheria, 32 (4) from diarrhœa and enteritis under two years, and 21 (1) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 224 (corresponding to a rate of 32 per thousand total births), including 13 in London.

WEEK ENDED DEC. 23

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1906; whooping-cough, 1317; diphtheria, 456; paratyphoid, 0; typhoid, 2; measles (excluding rubella), 8433; pneumonia (primary or influenzal), 715; puerperal pyrexia, 130; cerebrospinal fever, 33; poliomyelitis, 5; polio-encephalitis, 0; encephalitis lethargica, 1; dysentery, 173; ophthalmia neonatorum, 53. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Dec. 20 was 903. During the previous week the following cases were admitted: scarlet fever, 50; diphtheria, 30; measles, 61; whooping-cough, 14.

Deaths.—In 126 great towns there were no deaths from enteric fever, 13 (0) from measles, 3 (1) from scarlet fever, 10 (0) from whooping-cough, 5 (0) from diphtheria, 52 (3) from diarrhœa and enteritis under two years, and 28 (4) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 202 (corresponding to a rate of 29 per thousand total births), including 20 in London.

Births, Marriages, and Deaths

BIRTHS

BLAXTER.—On Dec. 23, in London, the wife of Lieutenant P. L. Blaxter, RAMC—a daughter.

BONEY.—On Dec. 28, in London, the wife of Lieut.-Colonel T. Knowles Boney, RAMC—a son.

HAMILTON.—On Dec. 28, at Glasgow, the wife of Dr. John Hamilton, Colonial Medical Service, Nigeria—a son.

HYLTON.—On Nov. 14, at Ahmednagar, India, Dr. Lorna Hylton (née Petersen), wife of Major W. H. Hylton, RAMC—a daughter.

MARRIAGES

HENDERSON—HART.—On Dec. 14, in London, John Anthony Henderson, surgeon lieutenant RNVR, to Barbara Joan Hart.

LOGAN—HOWELL.—On Nov. 22, at Liverpool, Robert Francis Leslie Logan, MB, MO to Netherlands ministry of shipping, to Betty Eugenie Howell, VAD, RN.

TOWNSEND—STONE.—On Dec. 28, in London, Wilfred Henry Townsend, surgeon lieutenant RNVR, to Elizabeth Patricia Stone.

DEATHS

AYTOUN.—On Dec. 23, at Bridgwater, John Henry Aytoun, MD EDIN., formerly of Broadstairs and Lasswade.

GRELLIER.—On Dec. 6, in India, Ernest Franz Waldemar Grellier, MB CAMB., lieutenant-colonel RAMC.

KELYNACK.—On Dec. 23, Theophilus Nicholas Kelynack, MD MANC., MRCP, JP, of Harpenden, aged 78.

MATHEWSON.—On Dec. 27, at Keswick, John Mathewson, MA, MD EDIN.

NEVILLE.—On Dec. 25, Leigh Neville, LRCP.

SIMPSON.—On Dec. 26, in London, George Augustus Garry Simpson, MRCS.

WALTERS.—On Dec. 24, Charles Ferrier Walters, FRCS, aged 69.

WILMOT.—On Nov. 24, Reginald Cameron Wilmot, MRCS, colonel late RAMC, aged 67.

AT 5 PM on Monday, Jan. 8, at 11, Chandos Street, W1, there will be a pathological meeting of the Medical Society of London.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

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PLEURAL AND PULMONARY SUPPURATION TREATED WITH PENICILLIN

J. E. H. ROBERTS, OBE, FRCS, SURGEON-IN-CHARGE
OSWALD S. TUBBS, FRCS, SURGEON
MICHAEL BATES, MRCS, SURGICAL REGISTRAR
EMS CHEST UNIT

PENICILLIN was made available to an EMS Chest Unit by the Medical Research Council's Penicillin Clinical Trials Committee, and this paper reports the results obtained. Initially there was only sufficient for local application, and its value in the prevention and treatment of empyema and extrapleural suppuration was studied first. More recently larger supplies were obtained and used systemically in the treatment of pulmonary infections but this latter investigation is far from complete.

The cases treated by local application fall into the following groups—

1. Hæmothorax (prevention of infection).
2. Pyogenic empyema.
3. Tuberculous empyema with secondary pyogenic infection.
4. Extrapleural suppuration (complicating thoracoplasty and extrapleural pneumothorax).

Hæmothorax

Although we were aware that many cases of traumatic hæmothorax had been treated with penicillin in the Mediterranean campaign, we were anxious to obtain sufficient cases to assess for ourselves its value in preventing infection, and to ascertain the amount and frequency of administration required to achieve this, before casualties arrived from the battle in France. Unfortunately only two such cases were forthcoming.

The first was a patient with carcinoma of the bronchus who was daily expectorating 2–3 oz. of purulent sputum derived from the lung distal to the site of obstruction. The predominant organism in this sputum was *Streptococcus viridans*, which was shown to be penicillin-sensitive. At the operation of pneumonectomy the lung was accidentally torn as a result of dense pleural adhesions, and pus was spilt in the pleural cavity. At the end of the operation the pleural cavity was carefully dried out and 30,000 units of penicillin (as well as some sulphanilamide-sulphathiazole powder) distributed around the space; the chest was then closed without drainage. No pleural infection occurred until 11 weeks after operation when a bronchial fistula developed. Blood-stained fluid aspirated 48 hours after operation did not contain a demonstrable amount of penicillin. (The rate of absorption of penicillin from the pleural cavity is discussed under the treatment of established empyema.)

The second case was an air-raid casualty in which the chest had been penetrated by a bomb fragment. The foreign body was removed at a primary operation and on culture yielded a profuse growth of a coagulase-negative staphylococcus. The pleural cavity was not drained after operation as very little bleeding had taken place into it. Subsequently a blood-stained pleural effusion developed, from which a coagulase-negative staphylococcus was grown. At the time of aspiration 20,000 units of penicillin was injected into the pleural cavity, and on re-aspiration 4 days later sterile fluid containing no demonstrable penicillin was withdrawn; a further 20,000 units was injected and no empyema developed.

It would obviously be wrong to draw conclusions from two cases, but we were impressed by the first case in which almost ideal experimental conditions obtained —i.e., an undrained hæmothorax which was known to have been contaminated by spilt pus.

Since June 6, 1944, we have treated 10 cases of hæmothorax resulting from penetrating wounds by the usual procedure of keeping the pleural space dry by aspiration, but, in addition, penicillin solution has been injected at each aspiration, the dose varying with the likelihood of contamination (15,000–60,000 units). Only one of these cases has become infected and this by coliform bacteria which are, of course, completely penicillin-resistant.

Infection of a hæmothorax results in a great increase of fibrin deposition, which often causes loculation; frequently some of the loculi contain infected fluid, whereas in others the fluid is sterile. Jeffery and Scott Thomson (1944) have drawn attention to the difficulty of getting the drug to the infected loculi, and the patient aspiration required to achieve this. It seems to us that, if this degree of clotting has occurred, rib-resection and evacuation of the clot is indicated, and that penicillin would be used more advantageously as a postoperative measure to prevent the pleural infection progressing to the stage of frank pus.

Pyogenic Empyema

When considering the part penicillin is likely to play in the treatment of acute pyogenic empyema, certain general principles must be kept in mind.

First, the period during which a patient's life is likely to be endangered by an empyema is the initial phase in its development, the stage in which there is a turbid unlocalised pleural effusion giving rise to severe toxæmia and occurring perhaps when the pneumonic infection is still active—e.g., a streptococcal empyema in a child or complicating an influenzal pneumonia. In these circumstances repeated aspiration of the fluid is usually performed in order to reduce the toxæmia but any agent which might be capable of still further reducing the toxæmia and of hastening localisation of the suppurative process would obviously be of great benefit.

Secondly, the correct treatment of a case in which the pus has become thick (indicating localisation of the empyema) is rib-resection, removal of pus by suction and of fibrinous masses with sponge-holding forceps, and the insertion of a drainage-tube which is not removed until the lung has completely re-expanded, this re-expansion being encouraged by breathing exercises and activity on the part of the patient. Anything which delays rapid re-expansion of the lung, such as pleural thickening, is bound to retard recovery and militate against complete restoration of respiratory function.

In addition to these general principles, it is well to remember that various agents sometimes capable of sterilising pleural pus in vivo are already known. For example, sodium taurocholate injected intrapleurally was used for a time to sterilise pneumococcal empyemata, but, although sterilisation was frequently obtained, its use was abandoned because of the poor functional result due to gross pleural thickening. Again, occasionally the pus in an empyema complicating a pneumonia which has been treated by intensive sulphonamide therapy is found to be sterile, or becomes so with continued chemotherapy, but, with the exception of those cases which never go on to form thick pus, drainage by the usual method is necessary if a contracted and relatively immobile chest is to be avoided.

On theoretical grounds therefore it seemed probable that penicillin would assist localisation of an empyema during the early phases in its development; it might even prevent the formation of frank pus and cause rapid absorption of the existing pleural exudate. Its value in the treatment of a case in which thick pus had already formed was much less predictable.

We have treated 12 cases of acute empyema with penicillin. In 11 of these the pleural exudate was already frank pus when treatment was started, so we have been able to observe the value of penicillin in the early invasive stage in only one patient.

A boy of 16 attended a hospital on Dec. 28, 1943, complaining of cough with foul sputum of recent onset. A radiograph showed an abscess in the right middle lobe but he was sent home. On Jan. 2, 1944, he was admitted to the Chest Unit in a very serious condition, having developed an acute exacerbation of his illness five days previously. He was cyanosed, orthopnœic, and coughing repeatedly with offensive breath and sputum; the pulse-rate was 160 per min. and the temperature 103° F. He had signs of a right pleural effusion which was confirmed by X-ray examination, and this also showed the underlying lung abscess. On aspiration of the chest, turbid stinking fluid containing gram-positive cocci and gram-negative bacilli was withdrawn; culture of this fluid yielded *Strep. viridans*, anaerobic non-hæmolytic streptococci and anaerobic gram-negative bacilli, all of which were shown to be penicillin-sensitive. After the aspiration, 60,000 units of penicillin was injected into the pleural cavity; aspiration was repeated next day and a further 30,000 units

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injected. Subsequent to this the pleural fluid became and remained sterile, but the most striking observation was the extremely rapid and great improvement in the patient's general condition, for in 4 days his desperate state on admission was entirely relieved. Aspiration and intrapleural injection of penicillin (total dose 180,000 units) were repeated on two more occasions, and after the first of these a bronchial fistula developed; this did not cause re-infection of the pleural pus but altered the character of the sputum from fœtid pus to penicillin-stained mucus. It is our impression that the bacteriostasis produced by the penicillin resulted in rapid diminution of the intense toxæmia and that this patient's life was thereby saved. The empyema was drained on Jan. 17 (15 days after admission) by rib-resection, since it was thought unwise to continue without drainage in the presence of a bronchial fistula. The patient is now well.

In the remaining 11 cases of acute empyema (those with frank pus at the time of admission) various methods of local application were tried. The infecting bacteria (hæmolytic streptococcus in 4 cases, pneumococcus in 3, staphylococcus in 1, non-hæmolytic streptococcus in 1, non-hæmolytic microaerophilic streptococcus in 1, and a mixed infection with *Staphylococcus aureus*, hæmolytic streptococcus, and non-hæmolytic streptococcus in 1) were shown to be penicillin-sensitive before treatment was started. In 8 out of 10 cases treated by aspiration followed by intrapleural injection of penicillin the pus was sterilised; sterility was achieved after a single injection in 5 cases, after 2 injections in 2, and after 3 injections in the other. The average dosage was 30,000 units initially, followed by 20,000 units at 48–72 hours intervals, a solution containing 1000 units per c.cm. being used. Sterility was not obtained in 2 cases simply because treatment was discontinued prematurely for some clinical reason (one patient received a single dose only, and, in the case with the mixed infection, treatment was stopped after 3 injections totalling 60,000 units which abolished all the bacteria except a few staphylococci).

The significance of a single sterile specimen of pus was not fully appreciated initially. In such a specimen poorly staining bacteria, many of them intracellular, might be seen in a gram film and recrudescence of the infection seemed possible. This in fact occurred in 2 cases, and, judging from this and our experience with other localised collections of pus, it is clear that at least 3 and preferably more injections subsequent to sterilisation should be given if permanent sterility is the aim.

Examination of each sample of pus for its penicillin content showed that the penicillin was only slowly absorbed from the empyema cavity, an appreciable quantity being invariably found 48 hours after the last injection (the average case at this time showed an 8 mm. zone of inhibition round an agar cup filled with the pus in a plate heavily inoculated with the Oxford H staphylococcus). In some cases there was still a detectable quantity after 4 days. This suggests that absorption may be slower through the walls of an established empyema cavity than through the virgin pleura—e.g., that associated with a traumatic hæmothorax.

Simple aspiration and intrapleural injection of penicillin were never continued for more than 24 days, so the final result obtainable by such treatment was never seen. It was not persisted with because the pus usually became thicker rather than thinner, and fibrinous masses often made it difficult or impossible to aspirate completely. Further, serial radiographs showed progressive pleural thickening which made it clear that the final functional result would fall short of that obtainable by ordinary rib-resection drainage. Butler, Perry, and Valentine (1944) have shown how severe this pleural thickening may be in cases treated without operation.

In 7 cases, intrapleural injection of penicillin was followed by rib-resection drainage and no further penicillin was used. In 4 of these cases the pus was sterile at the time of operation but this apparently had no favourable influence on the subsequent progress of the case—i.e., the empyema cavity did not become obliterated more rapidly than in the average case, in fact in 2 patients re-expansion of the lung was retarded because drainage had been postponed beyond the usual time.

In 3 cases intrapleural penicillin injection was used until the pus was sterile in 2 and almost so in one (in the case with mixed infection a few staphylococci persisted), and this was followed by rib-resection and evacuation of all pus and fibrin, the wound then being sutured round a fine-bore tube which was closed externally with a spigot and subsequently used for aspiration of pus and the instillation of penicillin. In the case with persistent staphylococcal infection the bacteria were still present after 4 days (20,000 units of penicillin daily), and since thick pus continued to form the tube track was enlarged and open drainage adopted. In one of the 2 sterilised cases, the tube was removed on the fifth day (the pus being sterile at this time), but the infection was again active 4 days later and open drainage was therefore instituted. (This patient received only one preoperative and one postoperative penicillin injection.) In the other case (hæmolytic strep. infection), penicillin was instilled twice weekly after operation, and, although the exudate became almost entirely serous, coagulase-negative staphylococci were cultured from it 2 weeks after operation; as X-ray examination at this time showed that a large cavity was still present, open drainage was provided.

Finally one patient with a mild staphylococcal infection was treated by rib-resection, evacuation of all pus and fibrin, and suture of the wound round a fine-bore tube, through which he received three instillations of penicillin during the first postoperative week; the tube was then removed because the exudate was sterile. No penicillin was given before operation. He was discharged 15 days after operation and now (5 months later) remains healed and well.

From our experience with these cases, and the valuable evidence produced by Butler et al. (1944), we feel that a combination of pleural aspiration and injection of penicillin alone as a means of "curing" empyema will result in many patients being left with gross pleural thickening and therefore diminished respiratory reserve. In some a residual, although sterile, cavity will probably remain, and these patients will swell the numbers of "latent" chronic empyemata. In many cases it is doubtful if the time taken to produce such a "cure" is any less than by the standard method of treatment. It seems probable therefore that penicillin has little, if any, part to play in the treatment of an empyema from which thick pus is obtained on aspiration and which is not giving rise to severe toxæmia. (Postpneumonectomy empyema is excepted from this opinion.) On the other hand, penicillin employed at the inception of empyema formation is likely to be a life-saving agent in patients with overwhelming toxæmia or those still suffering from active pneumonia, especially in children or aged people.

Tuberculous Empyema with Pyogenic Infection

Pyogenic secondary infection of a tuberculous effusion or empyema often results in grave toxæmia and usually necessitates pleural drainage; it also carries a very high mortality. Any drug capable of abolishing the pyogenic bacteria and thereby reducing toxæmia would be of inestimable value, for it might then be possible to persuade the lung to re-expand so as to obliterate the pleural space, or the patient might be rendered fit for thoracoplasty without preliminary pleural drainage.

An important distinction must be drawn between these cases and those of simple pyogenic empyema, for respiratory function can never return to normal in the tuberculous case and pleural thickening is therefore of no significance.

Persistent fever after pleural drainage is common and is generally thought to be due to continued tuberculous activity in the pleural membrane, but it is possible that the secondary infection plays some part in the toxæmia.

We have treated 7 cases of secondarily infected tuberculous empyema (5 undrained and 2 drained) with penicillin, and, although the results may not appear dramatic, we feel that penicillin is likely to play a very important part in the treatment of this type of case. None of our patients had a demonstrable bronchial fistula, which would almost certainly make the case unsuitable for penicillin therapy.

Some idea of the value of penicillin in this condition may be obtained from the following brief record of cases treated.

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CASE-RECORDS

CASE 1.—A man of 47, suffering from bilateral pulmonary tuberculosis, developed a spontaneous pneumothorax which had been treated by decompression through a needle connected to a water-seal. The needle track became infected with coagulase-positive staphylococci which subsequently spread to the pleural space. The pleural pus also contained a few tubercle bacilli. The pus was aspirated every 2–4 days and penicillin injected, large doses (50,000 units) being used on the first four occasions. The pus became sterile after the sixth injection (total dose 220,000 units). Unfortunately very large masses of fibrin formed (they could be seen protruding above the fluid level in a radiograph) which made further aspiration impossible, although there was gross mediastinal shift due to the bulk of exudate. Rib-resection and evacuation of the pleural contents were therefore performed and followed by drainage. The cavity was obliterated and the wound healed in 4 months.

CASE 2.—A woman of 32 was admitted with a total left-sided pyopneumothorax, the infection being an immediate sequel to thoracoscopy and division of adhesions; there was also a discharging abscess in the anterior chest wall at the site of previous pleural puncture. A profuse growth of hæmolytic streptococci was obtained from the pleural pus but no tubercle bacilli were found in it. A single injection of 30,000 units of penicillin (given on Jan. 18, 1944) resulted in sterilisation of the pus but the subsequent story is instructive. On Jan. 21 and 23 paracentesis was repeated and 15,000 units of penicillin injected on each occasion; examination of the pus on the 23rd showed a very few poorly staining cocci in a gram film but culture was sterile. On the 24th the chest-wall abscess was incised and a pure growth of hæmolytic streptococci obtained from the pus. On the 28th pleural aspiration was repeated and poorly staining gram-positive cocci in chains were again seen in the film although the culture was sterile; no penicillin was injected at this time. On Feb. 1 pus withdrawn grew hæmolytic streptococci, and, in addition, coliform bacilli in large numbers; the latter were, of course, completely penicillin-resistant but did not produce a penicillinase. More intrapleural penicillin again resulted in inability to culture the streptococci, but, since the coliform organisms continued in large numbers and a gross communication between the chest wall abscess and the empyema developed, the empyema was drained.

It is our belief that the coliform bacteria probably gained entrance to the empyema as a result of secondary infection of the chest-wall abscess. This abscess may also have been responsible for reinfection of the pleural cavity with hæmolytic streptococci, although it is equally possible that the cocci in the empyema were never completely destroyed; it is certain that 3 doses of penicillin totalling 60,000 units should not have been relied on to maintain sterility, especially in view of the demonstration of cocci in a gram film at the end of this course of treatment.

This case illustrates well how penicillin treatment may be frustrated as a result of secondary infection by penicillin-resistant organisms.

CASE 3.—A woman of 32 had had a three-stage thoracoplasty for pulmonary tuberculosis, a previous pneumothorax having failed because of adhesions and being complicated by an effusion. Two weeks after the last operative stage the pleural effusion apparently became secondarily infected, and it discharged spontaneously a month later through the thoracoplasty wound. A fortnight after this she was admitted for penicillin treatment looking very ill and running a high fever; pus yielding a profuse growth of hæmolytic streptococci was oozing from a sinus at the lower end of the thoracoplasty wound. On March 8 similar pus was aspirated from the pleural space and 38,000 units of penicillin was injected. Aspiration was repeated on March 14 and 17, 20,000 units of penicillin being injected on the 14th; no organisms were seen in a film of the pus obtained on the 17th and culture was sterile. On the 24th a further 20,000 units of penicillin (final dose) was administered, the pus withdrawn at this time showing no organisms in film or culture. The thoracoplasty wound had completely healed on April 16, and thick pus aspirated on April 18 was still free of organisms. The patient returned to the sanatorium on April 29, greatly improved in general condition and without fever.

In this case an empyema was sterilised—apparently permanently—by three penicillin instillations totalling 78,000 units. With regard to the likelihood of recurrence of infection, it is noteworthy that no organisms were seen in a gram film after the second dose; the complete absence of bacteria in a film in addition to a sterile culture is almost certainly much better evidence of final destruction of the bacteria than a sterile culture alone.

CASE 4.—A man of 27 had left-sided pulmonary tuberculosis which had been treated by an artificial pneumothorax; this was complicated by a tuberculous effusion following section of adhesions. Two weeks before admission for penicillin treatment the effusion became secondarily infected with staphylococci which caused persistent pyrexia and failed to respond to repeated aspiration. On March 13, 1944, thick pus was withdrawn and found to contain staphylococci and two types of gram-negative bacilli, one being *Ps. pyocyanea*. Aspiration was repeated on the 14th and 17th and 20,000 units of penicillin injected on each occasion; pus removed on the 17th showed some gram-positive cocci (mostly intracellular) and gram-negative bacilli; on culture the same bacilli grew but the cocci did not. On March 21, paracentesis and injection of 20,000 units of penicillin were again performed; the pus showed no cocci but the same bacilli were seen and cultured. In view of the persisting bacteria being completely penicillin-resistant no further penicillin was given but aspiration alone was continued. On April 5 the pus showed no organisms and was sterile. The patient, afebrile and improved in general condition, returned to the sanatorium on April 7.

TABLE I—CASE 5 (see text).

Day	Amount aspirated (oz.)	Character of pus	Gram film	Culture	Penicillin content (mm. inhibition of standard strain)	Penicillin injected (units)
1	4	Thin	Many cocci	Staphs, profuse growth	NE	60,000
6	1	Thick	Fewer cocci	Staphs, mod. growth	,,	70,000
8	30	,,	Few cocci (mostly intracellular)	Staphs, scanty growth	3	60,000
10	10	,,	Very occasional coccus	Sterile	5	45,000
12	16	,,	,,	,,	13	70,000
15	?	,,	No bacteria	,,	NE	20,000
19	6	,,	,,	,,	2	20,000
21	8	Thin	,,	,,	2	20,000
29	10	,,	Occasional coccus	Gram-neg. bacilli, scanty growth	NE	20,000
42	14	,,	No bacteria	Sterile	,,	20,000
					Total:	405,000

NE = not examined.

This case is of interest in that elimination of the initial secondarily infecting organism (the staphylococci) by penicillin was followed by the disappearance of the other organisms (which were penicillin-resistant) as a result of repeated paracentesis.

It is worth pointing out here that penicillin will almost certainly prove useless in cases of mixed secondary infection if this includes penicillin-resistant bacteria which produce a penicillinase and thus destroy the drug.

CASE 5.—A man of 24 had a tuberculous effusion secondarily infected with a coagulase-positive staphylococcus. When admitted for penicillin treatment he looked extremely ill and was running a high fever. He was treated by aspiration and intrapleural penicillin injection, the dosage and changes in the characters of the pus being shown in table I. Large doses were used because the empyema was total and a large space had to be sterilised; the doses used were probably not in excess of those required, for no sample of pus examined for its penicillin content contained a very high titre of penicillin (with the exception of that withdrawn on day 12). The findings on day 29 were probably due to contamination. Penicillin may have been continued longer than necessary but recurrence of infection was feared as a result of our experience up to this time.

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CASE 6.—A man of 37 was admitted in extremely poor condition with a tuberculous effusion secondarily infected with coagulase-negative staphylococci. Penicillin was not available at this time and the empyema was therefore drained. Three weeks later his condition was still deteriorating; penicillin was instilled through the drainage-tube which was then occluded for 3 days and the process repeated. No improvement resulted and the patient died 6 weeks after admission.

CASE 7.—A man of 24 had a drained secondarily infected tuberculous empyema. For 2 months he had been afebrile when his temperature rose suddenly to 104° F and examination of the pus from the drainage-tube revealed hæmolytic streptococci, pneumococci, staphylococci, and *Ps. pyocyanea* (the original secondary infection was an unidentified gram-negative bacillus); 20,000 units of penicillin in 150 c.cm. of saline was run into the cavity through the drainage-tube which was then spigoted; the field was released after 72 hours. After a day's interval the process was repeated for 24 hours and the pus subsequently released grew *Ps. pyocyanea* only. The fever settled during this period of penicillin treatment and the drug may well have played a part in its rapid subsidence.

Extrapleural Suppuration

Three cases of coagulase-positive staphylococcal suppuration occurring in the deep part of a thoracoplasty wound (the "apicolysis" or "Semb" space) have been treated by aspiration and injection of penicillin. In two of these the sutured part of the wound was not infected, but in the other the infection spread from the superficial part of the wound to the underlying space. In this third patient a fine tube was passed through a small deficiency in the wound and penicillin instilled through this each day; the staphylococci disappeared after 9 instillations but the space then became secondarily infected with *Ps. pyocyanea*, which necessitated drainage of the space as the patient continued febrile.

In the two cases with the superficial part of the wound uncontaminated, the space was aspirated from in front and penicillin injected every 3–4 days, the usual dose being 20,000 units; the interval between injections was increased towards the end of treatment. In one case sterility was obtained after 4 injections totalling 80,000 units and recrudescence of infection was prevented by 3 subsequent injections of 20,000 units each. The other case illustrates once again the danger of recurrence of infection when penicillin therapy is stopped prematurely (see table II). However, the space was ultimately permanently sterilised. Both of these patients returned to their sanatoria afebrile and with soundly healed wounds.

TABLE II—CASE OF SUPPURATION IN APICOLYSIS SPACE FOLLOWING THORACOPLASTY (see text).

Day	Amount aspirated (oz.)	Character of fluid	Gram film	Culture	Penicillin injected (units)
1	½	Thick, blood-stained	Staphs ++	Staphs, profuse growth	50,000
5	2	,,	,, ,,	Staphs, fairly profuse growth	40,000
8	2	,,	,, ,,	Staphs, scanty growth	20,000
12	11	,,	Occasional staphs	7 colonies of staphs	20,000
15	1	V. blood-stained	Some degenerate-looking cocci	1 colony of staphs	20,000
19	15	Thick, blood-stained	"Quite a lot of poorly-staining cocci"	Sterile	20,000
22	9	,,	"Few cocci"	,,	20,000
26	5	,,	No bacteria seen	,,	20,000
27	11	Blood *	,, ,,	,,	..
29	8	Blood-stained	"Few cocci"	,,	..
43	9	,,	Large numbers of cocci	Staphs, profuse growth	20,000
47	9	Thin brown	Cocci present	Staphs, less profuse growth	20,000
50	9	,,	Some present	Staphs, scanty growth	20,000
54	3	Yellow, turbid	No organisms	Sterile	20,000
57	3	,,	,,	,,	20,000
64	6	,,	Occasional coccus	,,	20,000
71	4	,,	No organisms	,,	20,000
78	2	Clear yellow	,,	,,	20,000

* Post hæmorrhage into space.

One case of extrapleural pneumothorax which had become infected with anaerobic staphylococci and anaerobic gram-negative diplococci was received for penicillin treatment. These unusual bacteria were both shown to be fully penicillin-sensitive. The space was aspirated and 20,000 units of penicillin injected every 3–4 days on 26 occasions. The pus became sterile for 4 separate periods, but, in spite of no relaxation in the dosage (total dose 590,000 units) or in frequency of treatment, infection by the anaerobic staphylococcus recurred each time. Complete evacuation of the contents of the cavity was obtained by suction through a thoracoscopy cannula on one occasion and by extrapleural irrigations performed before the penicillin instillation on two other occasions, but this made no difference and ultimately external drainage had to be provided.

It is hard to understand why the treatment failed, since there was never any evidence of a bronchial fistula which might have provided constant reinfection from the bronchial tree.

One interesting point is the report received after 240,000 units of penicillin had been used in treatment stating that the bacteria appeared to have acquired considerable resistance to the drug; this is the only time in our experience in which such resistance developed during treatment.

Pulmonary Suppuration

Sixteen cases of pulmonary suppuration have been treated by the systemic administration of penicillin. With one exception (case 7) all had been treated previously with sulphonamides without improvement.

Since the response to treatment has apparently depended more on the invading organisms than on any other factor (although the bacteria have been shown to be penicillin-sensitive in vitro in *all* the cases treated), classification according to the bacteriology is clearly the most satisfactory. On this basis we find that 7 were due to a non-hæmolytic, micro-aerophilic streptococcus, 6 to a mixed anaerobic infection, 1 to a combination of *Strep. hæmolyticus* and *Staph. aureus*, and 2 to actinomyces.

In addition, one case of acute tuberculosis was treated in error, the error arising from the finding of *Staph. aureus* in the sputum which was repeatedly negative for tubercle bacilli. Needless to say, therapy made no change in the patient's condition (although the staphylococci disappeared from the sputum) and death quickly followed.

METHOD OF ADMINISTRATION AND DOSAGE

In most cases the penicillin has been given by intramuscular infusion, using the continuous drip method; the site for such administration has always been the lateral side of the thigh. This has proved relatively satisfactory but our experience demonstrates the importance of strict asepsis, for 3 patients have developed an intramuscular abscess due to coliform organisms; these abscesses cleared up quickly on ceasing the infusion or transferring it to another site.

In a few instances 3-hourly intramuscular injections have been employed, especially for short periods (12–48 hours) as they make a change to the monotony of protracted drip infusions; if used for longer periods the repeated pricks become a source of anxiety to the patient.

Intravenous administration has been used occasionally, particularly early in the series, but phlebitis with consequent thrombosis was a constant and early feature. In one case (suffering from actinomycosis secondarily-infected with *Ps. pyocyanea*) suppuration due to *Ps. pyocyanea* developed in the thrombus and gave rise to a

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fatal pyæmia. In another, the infusion was continued for 24 hours after the first sign of phlebitis, and this resulted in fever to 106° F, with extreme redness and tenderness over the vein. Latterly, therefore, we have rarely employed this method, although Martin's (1944) suggestion of using heparin to prevent the thrombophlebitis may alter this practice.

The daily dose of penicillin for an adult has usually been 120,000 units, but in some cases this has been decreased to 90,000 or even 60,000 units when the larger quantity has yielded a high penicillin titre in the blood—e.g., complete bacteriostasis in 1:4 dilution and partial bacteriostasis in 1:8 dilution. A daily dosage of 120,000 units has always provided a blood titre such that bacteriostasis is complete in pure serum, and very often this quantity has resulted in complete bacteriostasis in 1:4 dilution.

The duration of therapy has depended largely on the response to treatment but has averaged 2 weeks. Complete absence of response at the end of a week has been deemed an indication for discontinuing therapy. Relatively long-standing infections, such as actinomycosis, have been given a longer course (3–4 weeks) than those with a short history.

GROUP 1: NON-HÆMOLYTIC MICRO-AEROPHILIC STREPTOCOCCI *

This group has not received general recognition, so it is necessary to outline the clinical picture of infection of the lung by this organism. Usually of sudden onset and often as a rather late sequel to a surgical operation, the subsequent story is that of a suppurative bronchopneumonia with a varying degree of abscess formation. The lesion is not localised to a single bronchopulmonary segment even at the start but is more widespread; the originally infected areas show a tendency to heal but recurrent exacerbations, often with extension to a previously uninfected part of the lung, are usual and death from gradual progression of the suppuration is common. Localised, sometimes multiple, empyemata often complicate the picture, and the frequency with which a brain abscess terminates the disease is particularly striking.

Seven of the cases treated with penicillin belong to this group and 5 of them improved greatly during treatment, the improvement being spectacular on one occasion (case 2). In the other 2 there was improvement in the pulmonary condition but both developed a cerebral abscess due to the same organism; this proved rapidly fatal in spite of continued systemic penicillin and, in one case, intrathecal and intraventricular injection of the drug.† Two of the 5 cases which improved greatly during penicillin administration developed an empyema in the course of treatment. This would seem directly comparable to the cases of sulphonamide-sensitive pneumonia in which pneumococcal or streptococcal empyemata develop.

Reports on 3 treated cases follow and these will give the best conception of the results. Case 8 demonstrates improvement followed by uncomplicated recovery. Case 9 is an example of recovery from the pulmonary infection but the picture became complicated by an empyema arising during treatment. This case was probably one of "pulmonary blast" with secondary infection by non-hæmolytic micro-aerophilic streptococci. Case 10 illustrates the clinical course of the disease before treatment was started and is also one of the 2 cases in which a cerebral abscess developed.

CASE 8.—A man, aged 37, had appendicectomy for gangrenous appendicitis 4 months before admission and this was followed by a subphrenic abscess which was drained. Subsequently a right-sided empyema consisting of two separate collections of pus—one at the base and one in the interlobar fissure posteriorly—was discovered and each loculus was drained; the causative bacteria were non-hæmolytic streptococci. The tube slipped out of the interlobar empyema before the cavity had healed and could not be reinserted. Two weeks before transfer *left*-sided pleuritic pain with cough and expectoration developed.

On admission, the patient looked exceedingly ill and emaciated; the fingers were clubbed and the temperature reached 101° F each night. A chest radiograph showed a small interlobar empyema on the right and a diffuse irregular opacity with cavitation in the upper part of the left lower lobe. The predominant organism in the sputum was a non-hæmolytic micro-aerophilic streptococcus.

Intramuscular penicillin was given by the drip method from April 14 to 21, 1944, inclusive (total dose 1,020,000 units). This was accompanied by great clinical improvement, resolution of the fever and cessation of expectoration. Radiologically there was more cavitation to be seen but otherwise little change. The interlobar empyema discharged spontaneously through the old wound on April 27 (the pus gave a pure growth of the same streptococcus), allowing the introduction of a rubber drain, and the patient has since made a complete recovery although there was a transient recurrence of sputum containing the same organism later (May 15).

CASE 9.—A woman, aged 20, received multiple injuries, including a penetrating head wound, from a flying-bomb on July 1, 1944. Operation was performed the same evening and much difficulty was experienced by the anæsthetist in overcoming cyanosis which had been noted before operation. The cyanosis persisted after operation and râles were heard at both bases, especially the left. A radiograph of the chest on July 4 showed a diffuse opacity of the left lower lobe and a smaller irregular shadow extending down from the hilum in the right lower lobe. She was given 66 g. of sulphamezathine as prophylaxis against infection. On July 16 her general condition was good, the temperature reached a maximum of 99° F, and the signs in the chest had decreased slightly. However, bilateral pleuritic pain, cough, dyspnœa, and fever developed next day, and the patient went progressively downhill until July 24, when she appeared moribund (T 101–103° F, P 150–180, R 40–70 per min.).

The sputum at this time showed the predominant infection to be a non-hæmolytic micro-aerophilic streptococcus. Intramuscular penicillin was started by the drip method forthwith and the improvement the following day was spectacular (T 98–99° F, P 120, R 30). On July 28 improvement was maintained, but signs of pleural fluid were present on the left and 3 oz. of turbid fluid containing a streptococcus exactly similar to that in the sputum was aspirated. The intramuscular penicillin drip (100,000 units per day) was maintained for 20 days; the temperature reached a maximum of 99° F during the last 11 days of this treatment. The pleural fluid nevertheless developed into thick pus and was not sterilised in spite of additional penicillin (60,000 units on July 31 and 40,000 units on Aug. 3) injected intrapleurally; drainage was therefore provided.

On Dec. 28 the patient was well, with the empyema healed.

CASE 10.—A man, aged 58, developed a low-grade suppurative process in both lower lobes after an abdominal operation (division of adhesions causing subacute obstruction) performed 12 weeks before admission. On admission he looked thin but not acutely ill. The temperature rose to 100–101° F each evening. A chest radiograph showed that the lesion in the right lower lobe had almost cleared up, but there were areas of consolidation with some small cavities in the right upper lobe; on the left there was still patchy consolidation in the lower lobe, one area showing a small central

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* Prof. L. P. Garrod has furnished us with a note on this organism—

"This streptococcus, which is very commonly found in lung abscess, and in empyema or cerebral abscess consequent on it, has the following characters.

Morphology.—A minute spheroidal coccus occurring in chains of varying but often considerable length, sometimes aggregated into masses.

Growth requirements.—No growth on plain agar: grows on blood agar, but more readily on serum agar; growth much improved by anaerobiosis.

Type of growth.—Colonies on blood agar aerobically are so minute as to be visible individually only with a lens. Anaerobically colonies slowly increase in size during several days' incubation to a diameter of about 3 mm.; they are convex, with an undulate, almost crenated, margin, smooth surface, an opaque white centre and translucent margin. There is no hæmolysis on blood agar. Growth in fluid media gives a granular or flocculent deposit.

Biochemical reactions.—Ferments glucose, galactose, maltose, lactose, and salicin; does not ferment raffinose, mannite or, inulin; action on saccharose variable. Acid and clot produced in litmus milk. Does not form indol. Not soluble in bile.

Test for soluble hæmolysin production in fluid media is negative. Extracts give no reaction with sera of Lancefield's groups A, B, C, and G. Non-pathogenic to mice (intraperitoneal inoculation)."

† Since this report was made, one of the apparent "cures" returned after a month with recurrence of the suppurative process (in a different part of the lung). This was treated with further intramuscular penicillin and he was again discharged apparently cured. He remained well for another month after which he was readmitted with a central abscess from which he died.

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cavity, and two small collections of pleural fluid, one in the axilla and the other against the mediastinum.

The predominant organism in the sputum, which averaged 6 oz. a day, was a non-hæmolytic microaerophilic streptococcus. The axillary empyema was drained on July 13, and the mediastinal collection was similarly treated on July 25, the pus in both instances gave a pure growth of the same streptococcus. There was very little improvement by Aug. 1, expectoration continuing unabated, and an X-ray film showed extension of the suppuration which now involved the whole of the right upper lobe and part of the left upper lobe. A course of systemic penicillin lasting 14 days was therefore started (total 1,680,000 units). This was accompanied by well-marked clinical improvement and abolition of the low-grade fever. The sputum, which was reduced to 3 oz. daily, was less purulent and now contained very few of the previously discovered streptococcus. Radiography showed less consolidation but more cavitation.

The improvement was short-lived, for the sputum increased after a few days and again showed vast numbers of the same streptococcus. On Aug. 23, 8 days after completing the penicillin, the temperature rose suddenly to 102° F and the patient rapidly became comatose. In spite of a further million units of intramuscular penicillin, he died on Sept. 5 from a left frontal lobe abscess caused by the same organism which had ruptured into the lateral ventricle.

At autopsy, widespread pulmonary suppuration, with many abscess cavities (most marked in the right upper lobe), was found; the oldest lesions had almost healed, with much scarring and secondary bronchiectasis.

GROUP 2: MIXED ANAEROBIC BACTERIA

Of this group of 6 cases only one showed real improvement during treatment. This failure to respond was particularly disappointing in view of the remarkably rapid destruction of bacteria of this type when treated locally in an empyema (see case of fœtid empyema discussed under local treatment and case (12). In 3 of the cases the infection had been present for 4, 8, and 9 months respectively, so there was considerable structural change in the lung and failure in these cases might have been attributed to the chronicity of the infection, but lack of response was equally well marked in one of only 5 weeks' duration (case 13). In the ordinary putrid lung abscess which starts as a localised infection there is sometimes a slough in the cavity and this would be likely to maintain infection, but only one of the treated cases (case 12) was of this localised type and no slough was present in the cavity at the time of drainage. At present therefore we are at a loss to explain the poor results.

The cases chosen for treatment have, with the exception of case 12, been extensive or diffuse infections, for we believe that external drainage will probably continue to give the best results with the localised putrid abscess.

The 3 cases reported below are chosen because case 11 demonstrates the only good result, case 12 illustrates the sensitivity of the bacteria to penicillin when attacked by local treatment, and case 13 is typical of the failures.

CASE 11.—A woman, aged 37, an epileptic, developed a cough with foul sputum and right-sided pleuritic pain about March 15, 1944. A fortnight later she was admitted to hospital where serial radiographs showed consolidation with cavitation starting in the right middle lobe and extending later into the pectoral segment of the upper lobe. Several severe hæmoptyses occurred while in hospital and 26 g. of sulphadiazine caused no improvement.

On admission for penicillin therapy (May 17) she looked ill and ran a low-grade fever. X-ray films showed consolidation with cavitation in the areas mentioned above. The sputum, which was blood-stained and extremely offensive, showed vast numbers of bacteria, mainly gram-positive cocci, gram-positive bacilli, gram-negative cocci and fusiform bacilli; anaerobic culture yielded a mixed growth but the organisms were moderately penicillin-sensitive with the exception of the gram-negative cocci which were fairly resistant. A course of penicillin was given by the intramuscular drip method from May 20 to June 8 (total 1,470,000 units). During this period the cough and sputum diminished, the sputum completely lost its offensive character, and the X-ray appearances greatly improved, for the opacity in the upper lobe decreased and the middle lobe lesion cleared up altogether. The bacteriology of the sputum remained qualitatively the same but there were far fewer bacteria. Subsequently the patient made an almost complete recovery. ‡

CASE 12.—A woman, aged 37, was admitted on July 6, 1944, with a putrid abscess of the pectoral segment of the right upper lobe and an expectorated empyema at the base on the same side. Although she had been in and out of hospital for 6 months owing to cough and expectoration, a radiograph taken on June 17 showed only a faint "fluffy" opacity in the right upper lobe, and it was therefore thought that the abscess and empyema were of recent origin.

On admission, she looked extremely ill and had fever rising to 102° F. The stinking brown pus aspirated from the empyema yielded a pure growth of *Staph. aureus* under aerobic conditions and a profuse growth of streptococci, various gram-negative bacilli, and some gram-positive bacilli under anaerobic conditions. All these organisms were penicillin-sensitive. The bacteriology of the offensive purulent sputum was similar. Penicillin solution was injected into the empyema on July 7 (60,000 units) and July 9 (40,000 units), as a result of which all the anaerobes were destroyed, but staphylococci were still present in profusion. Expectoration was so profuse (up to 15 oz. daily), much of it being derived from the empyema via the bronchial fistula, that drainage of the empyema was performed on July 11. Systemic penicillin (intramuscular drip) had been started on July 8 and was continued until July 22 (total 1,470,000 units) but this did not diminish the fever or expectoration, although the character of the sputum changed to inoffensive muco-pus. There was considerable improvement in the general condition. The lung abscess was subsequently drained externally because it increased in size.

CASE 13.—A man, aged 31, developed right-sided pleuritic pain, cough, and fever 5 weeks before admission; the sputum, initially small in quantity, soon increased and became foul. After admission on May 10, 1944, he looked pale and ill, and the temperature rose to 101–102° F each evening. A chest radiograph showed consolidation of the right upper lobe and a tomogram revealed small cavities in this lobe and showed that the lobar bronchus was free from obstruction. The sputum, which was slightly offensive and averaged 6 oz. daily, contained large numbers of organisms, especially gram-positive and gram-negative cocci and some fusiform bacilli; aerobic culture yielded a predominant growth of non-hæmolytic streptococci; anaerobic culture produced a profuse growth of hæmolytic streptococci, an unidentified gram-negative coccus, and non-hæmolytic streptococci. The hæmolytic streptococcus was reported as fully penicillin-sensitive and the gram-negative coccus and non-hæmolytic streptococcus as moderately so. Commencing on May 12 he was given 12 days' treatment with penicillin by the intramuscular route (total 960,000 units), but this caused no improvement in the volume of his sputum and little change in its bacteriology.

After the penicillin had been stopped, high fever persisted for 2 weeks; the pyrexia then ceased suddenly after a transient increase in the amount of sputum and the patient made uninterrupted progress to almost complete recovery.

GROUP 3: *Staph. aureus* AND *Strep. hæmolyticus*

Only one case of suppuration due to these organisms has been treated and this improved during therapy. Increased expectoration, indicating better bronchial drainage, followed initiation of penicillin therapy and the general improvement might possibly be explained by this alone, but it seemed to us that penicillin almost certainly played a considerable part in the excellent result. It will be noticed that the cavity in the lung persisted for a long time after all symptoms and signs had disappeared.

CASE 14.—A man, aged 51, developed an abscess in the right lower lobe after a 2-stage mastoid operation. He was admitted to the Chest Unit 2 weeks after the first chest symptom. At this time he did not look ill and was almost afebrile. A chest radiograph showed a circumscribed abscess cavity 2½ inches in diameter with a fluid level in the right lower lobe. The inoffensive purulent sputum, which averaged 1–2 oz. daily, contained hæmolytic streptococci and coagulase-positive staphylococci. Penicillin was given by intramuscular drip from April 26, 1944, to May 11 inclusive

‡ Subsequent to making this report and to the patient's discharge from hospital he developed a recurrence of the pulmonary suppuration and has been admitted to another hospital.

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total 1,380,000 units). The sputum increased during the early stages of this treatment, reaching a maximum of 7 oz. daily, then rapidly decreased and finally ceased. Culture of the sputum after 7 days' treatment failed to grow any hæmolytic streptococci and only a few staphylococci.

X-ray examination showed a smaller cavity and no fluid level at the time of discontinuing penicillin; the patient was subsequently free of symptoms but complete disappearance of the cavity was not demonstrated radiographically until July 6.

GROUP 4: ACTINOMYCOSIS

Two cases of thoracic actinomycosis—both with pulmonary infection and extensive chest-wall involvement—have been treated with penicillin.

The first patient died from *Ps. pyocyanea* pyæmia arising from suppurative thrombophlebitis of the infused vein, but the effect of the drug in vitro on the actinomyces obtained from this case was instructive for growth in glucose-broth was inhibited by 0·2 unit per c.cm. but not by 0·1 unit. (In a control test with the standard staphylococcus, the corresponding concentrations were 0·05 and 0·025 unit per c.cm.)

The other case reported below was indeed dramatic for the patient was transformed from a dying man to one who on Dec. 28 was apparently in good health. Nevertheless anxiety persists with regard to the permanency of the result. It will be noted that the second course of treatment was continued for a very long time (28 days) and that the daily dose was also unusually high (200,000 units); this was intended to reduce the risk of recurrence.

It is clear that penicillin therapy should receive a lengthy trial in actinomycosis of the chest, for the mortality has been terribly high in the past.

CASE 15.—A man, aged 22, had his left arm blown off and the left lower chest wall "peppered" when a hand-grenade he was carrying was detonated by a bullet on Nov. 2, 1943. He made good progress and all wounds healed, but while on disembarkation leave in January, 1944, he developed pain over the left 11th rib and was admitted to hospital. High fever followed and a swelling appeared over the left lower chest wall. On Jan. 25, 1944, the 11th rib was resected and a chronic localised abscess containing offensive pus was found just below the diaphragm. Signs of a left-sided basal pleural effusion were noted at this time. During the subsequent 4 months there was almost continuous pyrexia with occasional short remissions and the man went steadily down-hill in spite of blood transfusion and intensive therapy with sulphadiazine, sulphapyridine, sulphamezathine and sulphathiazole. In addition, swelling occurred below the left costal margin and in the left loin and three further drainage operations were performed. Finally a cough with about 2 oz. of sputum daily developed.

When admitted to the Chest Unit on May 23 he looked exceedingly ill, pale, and thin. The temperature rose to 100–101° F each night. There was much induration over the left lower chest wall and loin extending down to the iliac crest. A chest radiograph showed a left basal pleurisy and some "fluffy" opacity in the adjacent lung. Both the sputum and the pus from the unhealed drainage wounds contained numerous "sulphur granules" which microscopically consisted of the gram-positive branching mycelium typical of actinomyces. The actinomyces was cultivated and found to be an atypical strain requiring CO_2 as well as anaerobiosis for growth; the colonies were viscous and web-like instead of the usual compact mass. Its penicillin-sensitivity equalled that of the standard Oxford staphylococcus, and a course of penicillin was given by intramuscular drip method from June 26 to July 10 (total 1,800,000 units). The response was striking—the temperature, which had continued to rise to 100–101° F for 5 weeks after his transfer to the Chest Unit, became normal in 24 hours, the inflammatory changes around the sinuses disappeared, and the cough and expectoration ceased. Further, the discharge from the sinuses no longer contained sulphur granules and a chest radiograph showed complete absence of any pulmonary shadowing and much less pleural opacity.

For 3 weeks after this he remained afebrile and free of cough, and his general condition was greatly improved. Fever then returned, the chest wall again became red and indurated, and a few sulphur granules were found in the discharge. On Aug. 9 another course of penicillin lasting 28 days was started, 200,000 units being given daily. Response to this therapy was as rapid as before and all the sinuses had healed by the time treatment ceased.

It remains to be seen whether penicillin can be made to cure the disease finally rather than produce a remission.

Summary and Conclusions

Penicillin appears to lower the incidence of infection in cases of traumatic hæmothorax, which is in accordance with the findings of other investigators.

Twelve cases of acute pyogenic empyema have been treated locally with penicillin. Sterilisation is usually obtained readily, but aspiration and intrapleural injection of penicillin alone result in so much pleural thickening that operative treatment is required as soon as thick pus forms. Evacuation of all fibrin and subsequent closure of the wound may prove satisfactory in some cases but the most uniformly good results will probably be obtained by drainage. Intrapleural penicillin will clearly play its most important rôle in cases diagnosed at an early stage when the fluid is still thin and localisation has not occurred. This applies particularly to those of streptococcal origin with the pneumonic process remaining active, especially in children or the aged.

Intrapleural penicillin is a valuable agent in eradicating secondary infection from tuberculous pleural effusions.

Other local collections of pus in the chest—e.g., those complicating thoracoplasty—may be permanently sterilised by penicillin.

The systemic administration of penicillin in cases of pulmonary suppuration requires much further investigation. The response of diffuse suppuration due to non-hæmolytic micro-aerophilic streptococci appears to be good. The lesion in the lung improved in all 7 cases treated but extension to the pleural cavity was not prevented in 2, nor was metastatic spread to the brain in 3 others. Of 6 cases of suppuration due to a mixed anaerobic flora improvement was obtained in only one. This was surprising in view of the rapid disappearance of such bacteria from 2 empyemata treated locally.

A single case of localised pulmonary abscess due to *Staph. aureus* and *Strep. hæmolyticus* apparently responded well.

Two cases of thoracic actinomycosis were treated. One of these showed dramatic improvement and is now well; this case will be followed to see if the result is permanent. The other died of *Ps. pyocyanea* pyæmia originating from the infused vein.

We wish to thank all those who have helped and made possible this investigation.

We are indebted to the Penicillin Clinical Trials Committee of the Medical Research Council who provided the penicillin.

The immense amount of bacteriological work entailed in this investigation was carried out by Prof. L. P. Garrod and Miss P. M. Waterworth; in addition, Professor Garrod has given us much other help and advice. We are also grateful to Dr. T. A. Grimson, who undertook and supervised most of the systemic administration, and to those of our colleagues who made suitable clinical material available, in particular to Prof. R. V. Christie from whom we received much valuable counsel.

REFERENCES

Butler, E. C. B., Perry, K. M. A., Valentine, F. C. O. (1944) *Brit. med. J.* ii, 171.
Jeffery, J. S., Thomson, S. (1944) *Ibid*, ii, 1.
Martin, P. (1944) *Ibid*, ii, 308.

EVACUATION OF WOUNDED.—Better evacuation of wounded from the firing line has been made possible, the *Times* (Jan. 1) announces, by the use of a new small aircraft which pilots claim can "land in a cow pasture." These planes, called Norsemen, are Canadian-built. They can carry 3 stretcher-cases or 5 walking wounded, and their use was suggested by Brigadier-General M. C. Grew, chief surgeon of the United States Air Force in Europe. The big Dakota transports cannot land on the damaged airfields left by the retreating Germans, but the little Norsemen can slip in, take up casualties and carry them to the Dakota waiting, on the nearest big airstrip, to take them to hospital in France or England. The Norsemen are unarmed and not marked with the Red Cross. On their outward journeys they carry blood, penicillin, oxygen, and spare stretchers to surgeons working in the front line.

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CLINICAL EVALUATION OF DIPHTHERIA PROPHYLAXIS

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THE efficiency of prophylactic inoculation against diphtheria has been judged mainly on statistics of resulting Schick-conversion rates and of lessened incidence of the disease in communities so protected. As examples of the former, Fulton and his colleagues (1942) have shown that with modern dosage a Schick-conversion rate of 97% can be obtained with APT, while Freeman (1942) quotes a conversion-rate of 99% with TAF. On the other hand, the greatly lessened prevalence of diphtheria and of mortality therefrom in some North American cities are attributed to the policy of systematic active immunisation of children. Thus Fitzgerald (1938) found that in 1927–32 inoculation reduced the incidence by 90% in the inoculated as compared with the uninoculated, while the mortality has shown a large decline in the cities of the United States during 1928–40, which is held to be the outcome of prophylaxis (see *J. Amer. med. Ass.* 1942, **118**, 714). In Germany, however, the experiences of some physicians were not so happy, according to Forbes (1931). In England and Wales, the official view stated by Brincker (1943) was that for every immunised child who contracted diphtheria in 1942, 5·6 non-immunised children became victims; this relation was 1 : 11 for mortality from the disease. The parallel Scottish figures given by Russell (1943) were 1 : 8 for comparative incidence in school-children, 1 : 20 in preschool children; for mortality, the ratio was less than 1 : 100.

The following observations on the behaviour of diphtheria in Gateshead are based on clinical findings in subjects who were exposed to the same risk at the same time.

Since the autumn of 1936, Gateshead has had a high incidence of unusually virulent diphtheria, following on a period of low prevalence. The average annual notified case-rate was 0·76 per 1000 of population during 1901–35. From 1936 to 1943 there have been 2278 clinical cases. Deaths among these numbered 123, giving a case-mortality of 5·4%. The corrected annual case-rate during the last seven years averaged 2·7 per 1000, the highest being 4·4 in 1937, in which year the national uncorrected case-rate was 1·49 (1943).

In November, 1937, serial typing of the causal bacilli from cases admitted to hospital showed the prevalence of gravis strains in 35 and mitis strains in 39 of 78 cases, but in the years 1941–43 the predominant strain of infecting organism was *C. diphtheriæ gravis*, which was found in 128 of 158 cases (80%) from whom the causal organisms were typed. (The other strains isolated were intermedius 13, mitis 10, atypical 7.)

Systematic prophylaxis began in Gateshead in 1941 and was concentrated, at first, on all children under 12 years, the usual procedure being the injection of 0·1 c.cm. of APT followed by a dose of 0·5 c.cm. In May, 1942, the first dose was increased to 0·2 c.cm. of APT and the work directed mainly to the children under 5 years and entrant school-children. Children over 9 years of age were treated by three injections, each of 1 c.cm. TAF. Post-Schick testing was not done, so the term "inoculated" is used in referring to these children. Records were kept so that the dates, brand, and dosage of prophylaxis could be traced. Burroughs Wellcome products were used throughout in the children fully inoculated, except in 587 children, in whom one or both injections of APT were of an antigen later suspected to have been of low potency.

Out of a population under 15 years of age, which was fairly constant, and actually 26,825 at mid-year 1943, the numbers of fully inoculated children under 15 years, including about 300 inoculated by private practitioners or when evacuated, were 10,622 at the end of 1942 and 13,957 at the end of 1943.

INCIDENCE AND MORTALITY IN CHILDREN IN 1943

The number of inoculated children under 15 years at risk during 1943 is arrived at by taking the mid-year figures, and correcting for the ageing of children inoculated in previous years. The results of the comparison are given in table I, the children under 15 years, who had not had a full course of prophylactic, being subdivided into those who had had a single dose or two of TAF, those who had survived an attack of diphtheria in 1936–42, and those devoid of known immunising influences.

TABLE I—COMPARISON OF INCIDENCE AND MORTALITY OF DIPHTHERIA IN CHILDREN IN 1943

	Category	No.	Cases	Case-rate per 1000	Deaths	Case-mortality per 100
Children under 5 yr.	(*a*) Fully inoculated	2403	8	3·3	0	0
	(*b*) Other children—					
	1. Previous diphtheria	52	0	0	0	0
	2. Partly inoculated	385	4	10·4	0	0
	3. Unprotected	5615	53	9·4	6	11·3
	Total other children	6052	57	9·4	6	10·5
Children 5–14 yr. inclusive	(*a*) Fully inoculated	9886	84	8·5	0	0
	(*b*) Other children—					
	1. Previous diphtheria	1130	2	1·8	0	0
	2. Partly inoculated	2873	26	9·0	3	11·5
	3. Unprotected	4481	69	15·4	8	11·6
	Total other children	8484	97	11·4	11	11·3
All children under 15 yr.	(*a*) Fully inoculated	12,289	92	7·5	0	0
	(*b*) Other children—					
	1. Previous diphtheria	1182	2	1·7	0	0
	2. Partly inoculated	3258	30	9·2	3	10
	3. Unprotected	10,096	122	12·1	14	11·5
	Total other children	14,536	154	10·6	17	11·0

The ratio of incidence in the fully inoculated to that in unprotected children is 1 : 1·7, but in the preschool group it is 1 : 2·8. Despite a reservation due to smallness of numbers, it would appear that diphtheria confers on the survivors of an attack a high degree of protection against a second attack. There were no deaths from diphtheria in the fully inoculated but the case-mortality of the disease in partly inoculated and unprotected children averaged 11%.

Comparison of the 1943 case-rates in fully inoculated children according to methods and dosage of prophylaxis is bound to be difficult, because the ages of the children in the groups are dissimilar. Nevertheless a calculation shows that prophylaxis with APT, employing the larger first dose, resulted in a case-rate of 5·1 per 1000, while the TAF technique gave a case-rate of 6·1, and the dosage of 0·1 c.cm. and 0·5 c.cm. of APT was associated with a case-rate of 9·7.

ANALYSIS OF NOTIFIED DIPHTHERIA IN HOSPITAL, 1941–43

This refers to all cases discharged from or dying in hospital during the years in question. The following are the symbols used—F=Fully inoculated (2 APT or 3 TAF), P=Partly inoculated (1 APT, or 1 or 2 TAF), Non=Non-inoculated. Deaths are given in parentheses.

Errors of diagnosis.—The percentage of errors of diagnosis has remained for several years fairly constant at about 14% and is similar for protected and unprotected patients.

	F	P	Non
Apparent carriers	13	6	32
Tonsillitis	11	3	63
Laryngitis	..	1	8 (1)
Vincent's angina	..	..	3
Quinsy	..	..	1
Other conditions	1	..	15 (2)
Number revised	25	10	122 (3)
Total admitted	152	72	860

Some carriers probably had exudate on the tonsils before admission, but they have been included in the revised diagnosis so as to preserve accuracy.

Classification of clinical types.—The categories listed are those suggested by Harries and Mitman (1944), based mainly on the anatomical distribution of membrane.

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Of the 127 fully inoculated patients, 28 had received three injections of TAF and 99 two injections of APT; 19 of the latter received one or both injections of the relatively inert toxoid, but these were in no way to be distinguished clinically from the other inoculated patients, nor were 16 who received 0·2 c.cm. and 0·5 c.cm. of APT.

		F	P	Non
Anterior nasal		..	1	13
Tonsillar	mild	52	18	208 (1)
	mod.	34	12	185
	severe	19	11	80 (2)
Pharyngeal	mild	3	1	9
	mod.	9	6	33
	severe	3	2	53
Nasopharyngeal	mod.	3	2	21
	severe	3 (1)	7 (3)	107 (42)
Laryngeal		..	1	8
Faucial and laryngeal		..	..	15 (3)
Faucial and anterior nasal		..	1	3
Faucial and vulval		..	..	2
Faucial and labial		..	..	1
Palatal palsy		1	..	..
Total cases		127	62	738
Death		1	3	48

The fully inoculated child who died requires a note. A boy of 8 years was inoculated, while evacuated, with APT of good quality, receiving 0·1 c.cm. on July 1, 1941, and 0·3 c.cm. on July 25, 1941. He was admitted on Sept. 20, on the third day of severe nasopharyngeal diphtheria. Membrane covered both tonsils, the fauces, palate, and neck glands being swollen, and there was characteristic fœtor and nasal discharge; 80,000 units of antitoxin was given and a further 60,000 units on the 21st, because of a spread of membrane to the palate. A further spread went on until the 23rd, when there was also nasal and labial excoriation. On the 24th albuminuria commenced and it persisted. The membrane began to disappear, so that the throat was clean by the 28th. On the 29th there were two attacks of vomiting, nasal intonation appeared, the pulse became variable, and the colour pallid. Thereafter there were several attacks of cardiac collapse, attended by cyanosis. By Oct. 2 there was nasal regurgitation, muffling of the voice, and accumulation of mucus in the pharynx. The pulse-rate accelerated to 140 per min. and finally became imperceptible. The boy died on Oct. 4.

The death noted under mild tonsillar diphtheria was due to tuberculous meningitis in convalescence. Making allowance for this, the case-mortality from diphtheria was 0·8% for the fully inoculated, 4·8% for the partly inoculated, and 6·4% for the unprotected.

Follicular distribution of diphtheritic exudate, which was noted by Neubauer (1943) in 21 of a series of 50 cases of diphtheria in the inoculated, was seen in 28 of the foregoing 127 inoculated cases. It also occurred in 82 of the 738 unprotected cases, and apparently reflects the clinical mildness of the disease. The spots have occasionally been observed to coalesce into sheets of membrane later.

Comparative frequency of symptoms and complications.—The striking feature of this comparison is the extraordinary mitigation of the toxic phenomena of the disease as a result of previous inoculation.

	F	P	Non
No. of patients	*127*	*62*	*738*
Albuminuria transient	5	1	54
Albuminuria persistent	3	3	72
Cervical adenitis moderate	24	9	68
Cervical adenitis "bullneck"	1	10	98
Paralysis palatal	1	5	40
Paralysis pharyngeal	1	..	14
Paralysis widespread	..	1	13
Paralysis ocular only	..	..	3
Fatal myocarditis	1	3	45
Other cardiac anomalies	6	3	64
Hæmorrhagic forms	..	..	10
Hemiplegia	..	1	..
Convulsions	..	..	4
Acute nephritis	..	..	3
Jaundice	1	..	3

Albuminuria of persistent type occurred in 2% of the fully inoculated and in 10% of the unprotected, paralysis in less than 2% of the fully inoculated and in 10% of the unprotected, while "bullneck" was seen only once in the inoculated as compared with 13% in the unprotected. It will be noted that the disease in Gateshead in its unmodified form is often of the "hypertoxic" type, and all the "bullneck" cases are given at least 100,000 units of antitoxin promptly on admission. This dosage is based on clinical experience.

FAMILIAL INFECTIONS

An analysis of 23 familial infections in 1941–43 involving fully inoculated and uninoculated members (table II) can be summarised as follows. In 23 families, 25 children with an average age of 8 years, who had been fully inoculated and subsequently infected with *C. diphtheriæ*, yielded 16 carriers and 9 cases, mostly mild and without mortality, while, excepting the aunt and mother, 29 of their unprotected brothers and sisters, of the same average age but with a wider range of years, yielded 4 carriers, 11 mild cases, and 14 severe cases with 4 subsequent deaths.

TABLE II—ANALYSIS OF 23 FAMILIAL INFECTIONS IN 1941–43

Family	Age and particulars of members infected	
	Fully inoculated	Non-inoculated
W	R 8 Tonsillar carrier	A 8 Mild tonsillar
W	E 9 Tonsillar carrier	K 12 Severe nasopharyngeal
R	I 7 Severe tonsillar	A 12 Mild tonsillar
		G 9 Severe tonsillar
P	M 8 Tonsillar carrier	M 13 Severe nasopharyngeal
C	D 6 Tonsillar carrier	Aunt 23 Severe tonsillar
M	G 7 Tonsillar carrier	K 5 Tonsillar carrier
	V 13 Mild tonsillar	G 10 Severe tons. and labial
		R 13 Mild tonsillar
		E 17 Mild tonsillar
G	S 11 Palatal palsy	Mother 31: Mild tonsillar
D	J 1 Tonsillar carrier	D 7 Mild tonsillar
K	J 12 Tonsillar carrier	B 1 Tonsillar carrier
		M 3 Mild tonsillar
		R 6 Severe nasopharyngeal
H	A 9 Tonsillar carrier	R 5 Moderate pharyngeal
B	L 9 Nasal carrier	E 5 Severe nasopharyngeal (hæmorrhagic: died)
M	V 8 Tonsillar carrier	L 5 Severe pharyngeal
H	R 6 Tonsillar carrier	M 2 Severe nasophar. (died)
W	D 7 Tonsillar carrier	C 3 Severe nasophar. with palatal palsy
B	J 8 Tonsillar carrier	M 20 Mild tonsillar
F	L 9 Tonsillar carrier	B 7 Severe phar. and vulval
C	L 11 Tonsillar carrier	M 15 Mild tonsillar
W	W 7 Mild tonsillar	A 13 Tonsillar carrier
S	D 7 Mild tonsillar	G 4 Severe nasopharyngeal (died)
W	J 9 Mod. nasopharyngeal	M 4 Severe nasophar. and laryngeal (died)
	N 10 Tonsillar carrier	
N	M 12 Moderate pharyngeal	E 16 Mild tonsillar
P	D 12 Moderate tonsillar	N 9 Tonsillar carrier
		W 5 Moderate tonsillar
F	T 8 Mild tonsillar	M 2 Severe nasophar. with pharyngeal palsy
		C 3 Mild tonsillar

DISCUSSION

Comparison of the incidence of diphtheria in the fully inoculated with that in other children not so treated is disappointing, but the figures are not unique, for Glover and Wright (1942) state that in Liverpool during 1933–39 the diphtheria-rate in children over 10 years was much the same in the inoculated as in the others, although under 10 years the annual case-rate in the inoculated ranged from 1·5 to 3 per 1000, as against 11·3 in the others. Nevertheless, other results such as those reported by Anderson (1943), who gives the comparative incidence rates of 0·17 per 1000 in children who were naturally Schick negative, 0·31 in the immunised, and 2·9 in the non-immune, must make us reconsider some aspects of the problem of diphtheria.

In a continuous hospital experience of diphtheria since 1925 in five different towns in Great Britain, I have seen no cases of diphtheria so invasive and toxic as some of these Gateshead cases, apart from one or two very toxic cases in Kettering in 1925. In Gateshead one has often seen extensive membrane accompanied by painless œdema of the fauces and neck glands on the second day of the disease. Nor has treatment with antitoxin been as satisfactory in Gateshead as previously; the false membrane often spreads for two or three days after presumably adequate serotherapy and then disintegrates very slowly over a week or longer. This description tallies with the "malignant diphtheria" reported by Peters (1935) to have been present in Bristol

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since 1920, and that reported by German physicians in 1927 (quoted by Corson 1943). Gebbie and Leete (1935) report an epidemic in Hull in 1931–33 with a large proportion of very severe cases. In some of these the disease progressed to a fatal issue, even with antitoxin on the second day. Leete states that he had to alter his conception of diphtheria, and in searching for the explanation he found that "gravis" organisms were present in 59% of a series of cases in 1932–33. Still later, Leete (1943) reported that there have been two or three waves of the gravis form of diphtheria in Hull, that he has seen diphtheria in high immunes but always modified, and that he believes that any immune may go down with diphtheria when there is a heavy invasion of gravis organisms. Dudley and his co-workers (1934) studied diphtheria in Greenwich Hospital School from 1921 to 1933. After a period of diphtheria prevalence from 1921 to 1928 the school population was kept Schick-negative by immunisation where necessary. Diphtheria practically disappeared until a sharp outbreak, involving 23 cases, occurred in the winter of 1932–33, following the introduction of gravis organisms. All the causal organisms were of this strain in the cases, 21 of whom had been rendered Schick-negative by inoculation, but the clinical picture was that of modified diphtheria.

There can be no doubt that the gravis organisms prevalent in Gateshead belong to the virulent strains associated with hypertoxic or malignant cases of diphtheria, but that is only one of the factors, for there are also variable qualities to be found in the community and individuals attacked by the disease.

In the Greenwich study it is shown that latent immunisation of a community goes on by contact with carriers of virulent bacilli, and Dudley (1934) observes that 3 years' residence in a community where diphtheria is endemic could be accompanied by as high a frequency of Schick conversions as that produced by three injections of toxoid in 3 months. It must therefore be remembered that by 1943 Gateshead children had already been exposed to latent immunisation for 7 years. Many of the apparently unprotected school-children of this study had probably already been immunised by the natural process, and this would account for the poor differentiation of the comparable incidence-rates.

Turning to the clinical comparison of the disease in the contrasted classes, the first disappointment is replaced by well-founded satisfaction with the success of full inoculation in modifying the mortality and toxicity of the disease, which are diminished to a small fraction of that in the unprotected. A study of the familial infections gives point to this view, for here is a clear comparison under conditions usually only reproduced experimentally. The relative failure of *C. diphtheriæ* to produce the disease and its toxic results in the fully inoculated stands in striking antithesis to its effect on the unprotected.

Yet there remains, even in this small series, a paradoxical feature. Some young uninoculated subjects become carriers and some related inoculated persons present the clinical disease, albeit modified. In such instances the failure must be in the individual. The same postulate must also be invoked to explain this disease in 15 second attacks and in 11 Schick-negative nurses in Gateshead during 1941–43. There are some people who are unable to maintain antitoxic immunity at a sufficient level fully to protect against aggressive strains of diphtheria bacilli, although they may, when stimulated by actual infection, quickly produce a response sufficient to counter toxæmia.

CONCLUSION

Gateshead has had a severe outbreak of diphtheria spread over the past 7 years. A campaign of diphtheria prophylaxis has not reduced the prevalence to the extent it was hoped. An analytical study has therefore been made to ascertain the relation of the disease to the diphtheria inoculation procedure. As a result, emphasis is laid on the value of prophylaxis as a modifier of the result of invasion by diphtheria bacilli rather than a preventive of infection. This may appear a pessimistic view when the experience of the nation as a whole is considered, but it is suggested that full prophylaxis reduces the ill effects of invasion by diphtheria bacilli to about a tenth of those in the unprotected. If the prevalent strain of diphtheria organism in a community is aggressive and virulent, as in Gateshead, there will be an appreciable proportion of clinical cases in the inoculated; but these will be modified. On the other hand, if the prevalent bacilli are relatively non-aggressive and non-toxic, as in other parts of the country, the incidence of the disease in the inoculated will be reduced to the exceptional cases, which will then be so mild as to make a diagnosis on clinical grounds uncertain.

An incomplete inoculation course appears to have a negligible influence on the disease.

I have to acknowledge the help of Dr. M. Anderson, resident medical officer, Sheriff Hill Isolation Hospital, Gateshead, in going over the case-sheets with me to compile these tables. The bacteriological typing was carried out by Dr. R. Norton, city bacteriologist, through the courtesy of Dr. J. A. Charles, medical officer of health, Newcastle.

REFERENCES

Anderson, A. (1943) *Med. Off.* **69**, 37.
Brincker, J. H. (1943) *Lancet*, i, 742.
Corson, J. F. (1943) *Bull. Hyg.* **18**, 980.
Dudley, S. F., May, P. M., O'Flynn, J. A. (1934) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 195, pp. 27 and 90.
Fitzgerald, J. G., Fraser, D. T., McKinnon, N. E., Ross, M. A. (1938) *Bull. N.Y. Acad. Med.* **14**, 566.
Forbes, J. G. (1931) Diphtheria Past and Present, London, p. 539.
Freeman, W. (1942) *Brit. med. J.* ii, 123.
Fulton, F. et al. (1942), *Ibid*, i, 315, 349.
Gebbie, N., Leete, H. M. (1935) *Publ. Hlth*, **48**, 173.
Glover, B. J. T., Wright, H. D. (1942) *Lancet*, ii, 133.
Harries, E. H. R., Mitman, M. (1944) Clinical Practice in Infectious Diseases, Edinburgh, p. 136.
Leete, H. M. (1943) *Publ. Hlth*, **57**, 32.
MRC (1943) *Spec. Rep. Ser.* no. 247, p. 19.
Neubauer, C. (1943) *Lancet*, ii, 192.
Peters, B. A. (1935) *Brit. med. J.* i, 585.
Russell, A. (1943) *Lancet*, i, 741.

INADEQUATE TREATMENT OF SYPHILIS*

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MAJOR RAMC

IN early syphilis, once arsenical treatment on standard lines has been started, it must be continued regularly without major interruption until a minimum of 35–40 injections have been given. Otherwise relapse may follow, and the ultimate prognosis may be even worse after inadequate treatment than if treatment is entirely withheld. The nature of relapse lesions depends to some extent on the amount of treatment given.

It was an early discovery that the results from combined arsenical and heavy metal treatment are better than when an arsenical drug alone is used.

These are among the important points illustrated by the following cases.

CASE 1.—A man, aged 36, was admitted to a military isolation hospital on Nov. 4, 1943, with an ulcer on his chin. He had been exposed to infection with a woman known to have syphilis. Dark-ground examination of serum from the sore showed *Spirochæta pallida*. Blood Wassermann and Kahn reactions were positive. Apart from cervical and submental gland enlargement there were no other signs of disease. Bi-weekly injections of intravenous neoarsphenamine 0·45 gramme and intramuscular bismuth metal suspension 0·2 g. in water were begun at once. After 2 weeks' treatment, when 1·8 g. neoarsphenamine and 0·8 g. bismuth had been given, the patient absconded from hospital. He was well, physically and mentally, at this time, and the chancre had healed.

On Jan. 26, 1944, 10 weeks later, he returned to hospital feeling ill. He complained of weakness, malaise, and anorexia, but his chief symptom was occipital headache unrelieved by ordinary measures. He had had no treatment during his period of default. The only abnormal signs were slight neck-rigidity and enlargement of the posterior auricular lymph-glands. His mental condition had greatly deteriorated, and depression had replaced his original alertness. Blood Wassermann and Kahn reactions were both strongly positive. Cerebrospinal fluid findings were: WR positive; globulin in excess; Lange 4555553310; leucocytes 340 per c.mm.

Comments.—According to the modified clinical and anatomical classification of Head and Fearnsides,[1] this case was one of neuro-recurrence as distinct from

* This article was written a year ago. Since then the treatment of early syphilis in the Army has been modified, and penicillin is now in routine use.—ED. L.

1. Head and Fearnsides in Moore's Modern Treatment of Syphilis, 2nd ed. p. 356.

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syphilitic meningitis and asymptomatic neurosyphilis —i.e., a more or less purely meningeal neurosyphilis. Clinical evidence of this form is comparatively rare in untreated cases of early syphilis (about 0·3%), and is practically non-existent in adequately treated cases In cases however in which treatment has been inadequate or interrupted the incidence of neuro-recurrence is 2–3%.

It is generally accepted that a varying degree of immunity to both intrinsic and extrinsic *Sp. pallida*, cellular, humoral, or both, is developed in the infected untreated patient. In early syphilis, treatment may interrupt or destroy this gradually produced resistance, so if treatment is stopped short of complete biological sterilisation the patient is left without adequate defence against the multiplication and dissemination of spirochætes still existing in foci not yet reached by the treponemicidal drugs. The result in this case was neuro-recurrence, which developed typically 8–10 weeks after interruption of antisyphilitic treatment. There was no evidence of optic neuritis, iritis, or ophthalmoplegia, which often accompany neuro-recurrence. The mental strain and physical deterioration resulting from existence as a deserter from the Army may, as noted by many workers, have favoured development of neurosyphilis.

CASE 2.—A man, aged 22, was diagnosed as secondary syphilis on Nov. 27, 1943, at an Allied special centre. He had healing anal condylomata and mucous patches, and his blood Wassermann and Kahn reactions were positive. Treatment was started at once and in seven weeks he was given 4·45 g. of intravenous neoarsphenamine but no heavy metal. On Jan. 27, 1944, he was admitted to hospital with a widespread secondary psoriasiform eruption, said to have begun after the second injection of arsenic and to have increased gradually. The eruption was particularly well marked on the face and palms, and there was superficial ulceration of the tongue with general hyperæmia of the fauces. The primary sore had healed. The last arsenical injection before admission was on Jan. 26. At this time the blood WR was positive. He refused lumbar puncture, but there was no clinical evidence of nervous involvement.

Treatment was with bi-weekly injections of 0·09 g. 'Neohalarsine' intravenously and 0·2 g. bismuth intramuscularly; after two injections of each there was pronounced improvement in the eruption, which gradually disappeared. After 3 weeks the patient was discharged to outpatient treatment.

Comments.—Harrison [2] and others have repeatedly stressed the importance of simultaneous administration of arsenic and bismuth in early syphilis. They claim a lower incidence of early relapse than in cases treated by alternate courses of these drugs. More recently, Belding [3] has shown that in early syphilis the combination of arsenic and bismuth reverses the serological tests more rapidly than does arsenic alone. In case 2 no bismuth was given in the first course, and in spite of regular arsenical therapy mucocutaneous progression occurred. The lesions rapidly disappeared on continued treatment with addition of intramuscular bismuth.

CASE 3.—A man, aged 43, was admitted to hospital in November, 1943, with a generalised pyodermia of about 6 weeks' duration. He gave a past history of secondary syphilis in August, 1938, when a skin eruption followed several months after a penile sore. His blood WR was then positive. He received two courses of neoarsphenamine and bismuth treatment, in all about twenty injections spread over the next 14 months. In November, 1939, the blood Wassermann reaction was negative, and it continued negative when tested at intervals until June, 1943.

On admission there were many small septic ulcers on the trunk and limbs and an area of indolent inflammation and œdema about 2 in. in diameter over the right malar region. The blood Wassermann and Kahn reactions were strongly positive, but there was no abnormality in the cerebrospinal fluid. Before the results of these tests were received, he complained of "rheumatism" of both knees and ankles with pain in both tibiæ. In a few days there was a bilateral synovitis of the knees and tenosynovitis of both achilles tendons. There was also a tender bony swelling on the shaft of the right tibia. X ray of heart and great vessels showed no abnormality, and there were no lesions of the eyes. X ray of the tibiæ showed the left to be normal, but a periostitis with deposition of new bone leaving an obvious boss on the right. Treatment was started again with potassium iodide and bismuth, and later 'Arsenoxide' was introduced. The synovitis subsided in 7 days, and the tibial pain and skin lesions and general condition improved gradually. The patient was discharged in 14 days symptom-free, and with only the boss on the right tibia remaining.

Comments.—This case illustrates the allergic inflammatory type of relapse of benign late syphilis with lesions of structures not essential for the maintenance of life or vision—e.g., skin, bone, joints, tendon sheaths. The original treatment for syphilis contracted in 1938 consisted in an inadequate dosage of antisyphilitic drugs given irregularly and intermittently over a period of 15 months. Treatment was discontinued, presumably as a result of misinterpretation of negative serological tests by the patient. The interval between cessation of treatment and clinical relapse in this case was almost 4 years.

2. Harrison, W. *Practitioner* 1931, **126**, 193.
3. Belding, *Amer. J. Syph.* August, 1941.

SUMMARY

Three cases of early neuro-relapse, mucocutaneous progression in spite of treatment, and late osseocutaneous relapse all resulted from interrupted or inadequate treatment of early syphilis.

They emphasise the importance of regular therapy with arsenic and bismuth, and of persisting with treatment for the standard period in any routine, even though serological negativity has been obtained quite early.

PRIMARY MUMPS ORCHITIS WITH MENINGITIS

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CLINICAL meningitis is a rare complication of mumps; its incidence varies from 0·15% to 0·5% in different epidemics (Paddock 1932). It usually appears within a week of the parotid swelling but may precede the parotitis or be the sole manifestation of the disease. There are few case-reports of meningitis as the only feature of mumps, and in several instances the diagnosis is open to doubt. This is particularly true of the 4 cases recorded by Howard (1919). Primary mumps orchitis also is uncommon, though Stengel (1936) quoted series of 64 and 84 cases. Harris and Bethel (1938) have reported one case in which the sole manifestations of mumps were meningitis and orchitis. The following case is recorded because of its rarity and unusual features.

CASE-REPORT

A man, aged 18, was admitted to a Naval hospital on June 24, 1942. He had joined the Royal Navy six weeks previously. There was no relevant past medical history; he had never had mumps. He felt well until the 21st, when on parade he suddenly vomited without any previous feeling of nausea or abdominal discomfort. He was seen immediately by a medical officer who could find no abnormal physical signs, and since the patient insisted that he felt quite well he was allowed to carry on with his duties. The same evening he began to feel a little off colour and he vomited again. Next morning he developed mild headache and vomited several times, so was admitted to the sick-bay for observation. On the 23rd, as he was rather drowsy and apathetic, lumbar puncture was performed; the fluid was clear and colourless but contained a large number of lymphocytes.

On admission to hospital next morning his temperature was 101·8° F, pulse-rate 76 per min. He was drowsy and apathetic, but answered intelligently. No parotid swelling. Moderate neck-rigidity. Kernig's sign positive. No other abnormalities were found in the CNS or other systems except fairly numerous extrasystoles, which were not noticed subsequently. No sign of infection of the middle ear, and X rays of the paranasal sinuses and the chest were normal. Blood and cerebrospinal fluid findings are shown in tables I and II. Urinary diastatic index 6·7 (normal for method used); blood-culture sterile; throat and nose swabs grew no pathogenic organisms; Wassermann and Kahn reactions negative in blood and CSF.

The patient's condition remained unchanged until June 28, when his temperature rose to 102·6° F, and he complained of pains in the hips and knees. There was no limitation of movement and no swelling of the joints, but movement of the lower limbs was painful. On the 29th he seemed better in

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TABLE I—CEREBROSPINAL FLUID EXAMINATIONS

Date	Pressure (mm. CSF)	Cells (per c.mm.)	Lymphocytes %	Protein (mg. per 100 c.cm.)	Globulin	Sugar (mg. per 100 c.cm.)	Chlorides (mg. per 100 c.cm.)	Gold curve
June 26	250	1300	96	80	Excess	50	710	0000121000
,, 27	160	2300	100	90	Excess	50	720	0000132100
,, 28	160	1380	90	80	Excess	55	700	0000011000
July 5	200	300	100	100	No excess	ND	720	0000110000
,, 11	120	10	100	30	No excess	ND	730	No change
,, 20	110	2	100	30	No excess	50	760	No change

ND = Not done.

Gram stains and culture on blood-agar of all the above specimens revealed no organisms, and guineapig inoculations of specimens 2 and 3 were negative for tubercle bacilli. Subdural inoculation of a rabbit with specimen 4 produced no signs of encephalitis in the animal.

himself and the signs of meningeal irritation were less, but the temperature rose to 104° F and he complained of severe pain in the right testicle, which was tender, with tense generalised swelling of testis and epididymis, the groove between the two being just distinguishable. The condition was treated with glycerin and ichthyol locally and a suspensory bandage. This was the only treatment given throughout the whole illness. Next day the testicle was rather more painful, but the patient's general condition was much improved, and the neck-rigidity had almost gone. On July 1 his temperature was normal, and the testicle was smaller and less painful. From then on all the symptoms gradually subsided, and by July 14 there were no abnormal signs in the CNS and the

TABLE II—LEUCOCYTE COUNTS (per c.mm.)

Date	Total white cells	Polymorphs	Lympho-cytes	Mono-cytes	Eosino-phils
June 26	10,200	5814 (57%)	3876 (38%)	510 (5%)	..
July 5	6300	1575 (25%)	4536 (72%)	189 (3%)	..
,, 15	12,300	5781 (47%)	5904 (48%)	492 (4%)	123 (1%)
Aug. 18	6500	2015 (31%)	4225 (65%)	195 (3%)	65 (1%)

genitalia felt normal. At no time was there any swelling of the salivary glands, or of the left testis and epididymis.

On his return from sick-leave on Aug. 15 the patient was quite fit. There was no impotence; he said he had had successful intercourse while on leave. The right testis and epididymis felt normal.

DISCUSSION

The case presented the clinical picture of lymphocytic meningitis and epididymo-orchitis in a young adult. The reasons for attributing the condition to the virus of mumps were the benign course, the blood lymphocytosis, and the symptoms of meningitis, orchitis, and arthralgia; this last is a rare but well-recognised complication of mumps (Rolleston 1932).

French writers (Roux 1914, Urechia 1936, Urechia and Elekes 1936) attach much importance in mumps meningitis to the presence of bradycardia and the absence of vomiting, but in the present case bradycardia was not a feature and the illness was ushered in by violent vomiting. The lymphocytosis in the blood persisting 8 weeks after the acute stages of the disease has not been described in mumps as far as could be ascertained.

In the differential diagnosis the question arises whether orchitis ever complicates the clinical picture of lymphocytic choriomeningitis. The virus of this disease has been demonstrated in the testes of experimentally inoculated monkeys, but no macroscopic changes were discernible in the organs so infected (Armstrong et al. 1936), and no involvement of the testes has been described in the disease in man. Farmer and Janeway (1942) have emphasised the constant occurrence of a polymorph leucocytosis in the blood in the meningeal stage of lymphocytic choriomeningitis; this was at no time present in our case.

Three cases of mumps from the patient's training establishment were admitted to hospital during the 4 weeks before his illness, and although it was not possible to prove that he had been in direct contact with any of these, contact was more than likely.

SUMMARY

A case of lymphocytic meningitis with epididymo-orchitis and arthralgia but without parotid swelling is described and attributed to the virus of mumps.

Unusual features were the sudden onset with vomiting, the pleocytosis in the cerebrospinal fluid, and the persistence of blood lymphocytosis 5 weeks after the subsidence of all symptoms.

REFERENCES

Armstrong, C., Wooley, J. G., Onstott, R. H. (1936) *Publ. Hlth Rep., Wash.* **51**, 298.
Farmer, T. W., Janeway, C. A. (1942) *Medicine*, **21**, 1.
Harris, W., Bethel, H. (1938) *Lancet*, ii. 422.
Howard, T. (1919) *Amer. J. med. Sci.* **158**, 685.
Paddock, B. W. (1932) *Amer. J. Dis. Child.* **44**, 565.
Rolleston, J. D. (1932) *Practitioner*, **128**, 31.
Roux, G. C. (1914) *Gaz. Hôp., Paris*, **87**, 549.
Stengel, A. (1936) *Amer. J. med. Sci.* **191**, 340.
Urechia, C. I. (1936) *Bull. Soc. méd. Hôp., Paris*, **52**, 450.
— Elekes, N. (1936) *Ibid*, **52**, 1290.

INTUSSUSCEPTION COMPLICATING AMŒBIC DYSENTERY

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ON July 19, 1944, an NCO of an Indian AA battery was admitted to the medical wards of a general hospital complaining of diarrhœa. At about midnight I was called to see him, as he appeared to be having severe abdominal pain, and a lump had been noticed in the upper part of the abdomen. He said he had had a certain amount of diarrhœa since the 17th. On the morning of the 19th, after a disturbed night, he had noticed mucus and flecks of blood in his stools, had consequently reported sick, and been admitted to hospital. During the day he had had mild griping pains in the abdomen from time to time, culminating in the passage of a stool and a period of comfort. At about 6 PM, however, the character of the pain changed, becoming continuous with exacerbation at intervals, making him double up. At the same time vomiting had begun, the stools were less in number—he had passed only 3 in the six hours that elapsed between the onset of severe pain and the time I saw him—and consisted almost entirely of blood.

The patient was a spare man. The abdomen moved normally on respiration. Through his thin abdominal wall a clearly defined oval swelling was felt above and to the right of the umbilicus; the fingers could be readily inserted between it and the right costal margin. The swelling was tender and the size of a cricket ball, and during palpation, the patient being seized with an exacerbation of pain, it was clearly felt to harden. Palpation in the right iliac fossa revealed no positive finding, but no cæcal gurgling could be elicited. Vomiting was forceful, yielding a clear copious vomit. A stool passed shortly after examination consisted of dark blood, containing some mucus but no fæcal matter.

A diagnosis of intussusception was made and the patient advised to undergo operation. This he refused to do, and on the probable consequences of his refusal being explained to him he agreed that if in the morning his commanding officer considered operation necessary then he would certainly allow us to operate! We got into communication with the man's unit. At about 8 AM on the 20th, while his own officer was on his way to the hospital, his pain cleared up, the abdominal swelling disappeared, the right iliac fossa felt fuller than it had done, and there was now well-marked gurgling over the cæcum. Vomiting ceased, and the stools became frequent and small, consisted of blood-stained mucus and fæcal matter, and contained vegetative forms of *Entamœba histolytica*. A course of emetine subcutaneously was instituted; the diarrhœa was rapidly controlled and there has been no return of symptoms.

Intussusception rarely complicates amœbic dysentery and spontaneous reduction in such a case must be rare.

I wish to thank Brigadier H. G. Winter, DDMS, Indian Army, for permission to publish this case.

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ASYMMETRY OF EXOPHTHALMOS IN ORBITAL TUMOUR AND GRAVES'S DISEASE

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UNILATERAL exophthalmos is usually the most striking sign in orbital tumour. It may also be conspicuous in Graves's disease, but here its frequency appears to have been greatly over-estimated, probably because of inclusion of cases with simple unilateral lid-retraction. Thus it may be shown by measurement that conspicuous ocular asymmetry rarely occurs in fully developed Graves's disease. But in the uncommon ophthalmic forms—those without goitre and hyperthyroidism ‡—it is often found, and owing to the absence of systemic manifestations the true nature of the condition may be overlooked; indeed the orbit has often been explored in search of a tumour.

It can be shown, however, that the degree of asymmetry in tumour is clearly greater than in this type of Graves's disease, and this is an important differentiating sign. By measuring the extent of asymmetry it is also possible to estimate the bulk of orbital tumours.

METHOD

Orbital tumour material consists of data from 12 patients examined personally and exophthalmometer readings from a series of 9 recorded by Ellett (1941). Ocular asymmetry is compared with that in groups of patients with thyrotoxicosis and ophthalmic forms of Graves's disease. Only ophthalmic forms occurring spontaneously are used for the comparison, since cases developing after thyroidectomy are unlikely to be confused with orbital tumour.

The bulk increase in orbital contents corresponding to different degrees of proptosis has been determined by injecting molten wax into the retrobulbar space post mortem, the resulting protrusion of the eye being measured with Hertel's exophthalmometer. Details of the method and results are fully described elsewhere (Rundle and Wilson 1944).

RESULTS

Asymmetry in prominence of eyes.—The table gives the mean and range of values for asymmetry in different groups of subjects. The mean figure in a random sample of thyrotoxics is not significantly greater than in controls, but in ophthalmic forms of Graves's disease it is clearly higher and in orbital tumour higher still.§ Fig. 1 shows data from patients in the last two groups. It appears that 6 mm. may be taken as the approximate upper limit of asymmetry in Graves's disease; this figure is exceeded in over 80% of tumours. Thus a high value for the difference between the two eyes favours the diagnosis of tumour. Tumour growth inevitably tends to produce pronounced asymmetry, but a low difference does not exclude tumour since attendance at hospital may be early—for example, when the growth affects the optic nerve.

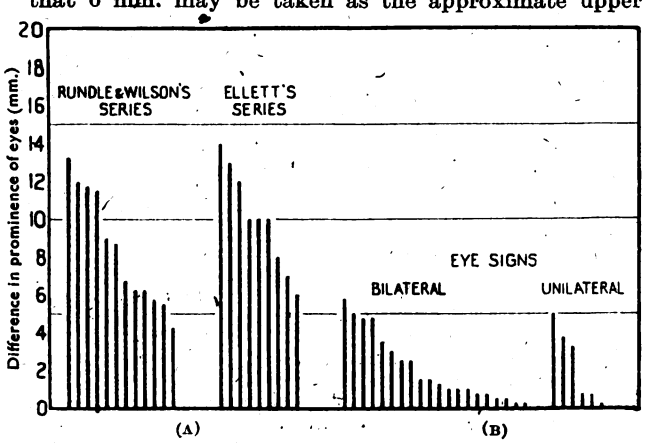

Fig. 1—Asymmetry of ocular prominence in (A) orbital tumour and (B) ophthalmic forms of Graves's disease.

ASYMMETRY IN PROMINENCE OF THE EYES, MEASURED WITH THE EXOPHTHALMOMETER

Clinical group	Cases	Mean difference and standard deviation (mm.)	Range (mm.)
Normal	62	0·32 ± 0·4	0–2·5
Thyrotoxicosis ..	111	0·51 ± 0·5	0–2·5
Ophthalmic form of Graves's disease	26	2·07 ± 1·7	0·25–5·5
Orbital tumour (combined series)	21	9·09 ± 3·0	4·25–14·0

In Graves's disease, on the other hand, the changes presumably depend on a systemic agent, and when it acts intensely both eyes tend to be affected. But remarkably enough clinical signs may remain unilateral indefinitely, and in such patients up to 5 mm. of asymmetry may be present (fig. 1). This represents a major degree of proptosis in Graves's disease and shows that fairly severe involvement of one eye may occur without any apparent affection of the other. It has been shown in thyrotoxicosis that pathological changes are present in orbital tissues even when eye signs are absent (Rundle and Pochin 1944). Similarly, in clinically unilateral cases, both orbits may be involved, the change on one side merely being too slight to produce signs.

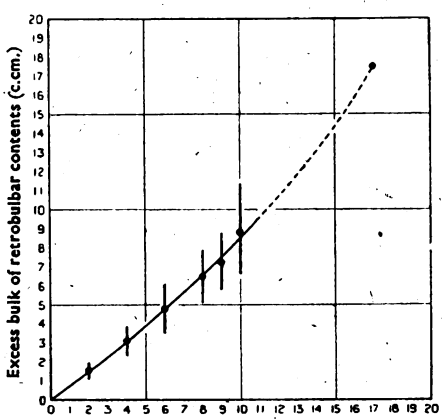

Fig. 2—Bulk increase of retrobulbar contents corresponding to different degrees of proptosis. The points indicate means and the vertical lines standard deviations from 10 experiments. The gradient of the interrupted continuation of curve was determined in one case only.

Bulk increase in retrobulbar contents.—The ratio between ocular protrusion (mm.) and increase in bulk of orbital contents is expressed by a curve (fig. 2). In its early stages 1 mm. proptosis results from a bulk increase of 0·75 c.cm.; with extreme proptosis the ratio decreases to approximately 1 mm. for every c.cm. Post-mortem measurements demonstrate (Rundle and Pochin 1944) that the prominence of the eye is closely correlated to the degree of orbital filling as determined by the ratio (bulk of retrobulbar tissues): (volume of orbit). The relative bulk of orbital tissues is low when the eye is sunken and raised when it is prominent. The initial part of the present experimental curve may be compared with the regression line of this correlation, which gives a value of 0·7 c.cm. bulk increase for each additional 1 mm. of ocular prominence.

From the curve we can deduce that the average volume of tumours in the series was 7·5 c.cm. with an approximate range of 3·3–14·0 c.cm. In ophthalmic forms of Graves's disease, the average bulk excess on one side was 1·6 c.cm. with an upper limit of 4·3 c.cm. From exophthalmometry and use of this curve we can estimate the volume of individual orbital tumours and the extent of spread to the orbit of tumours arising in adjacent structures.

CONCLUSIONS

Asymmetry of exophthalmos is rarely pronounced in thyrotoxicosis but is often severe in ophthalmic forms

* Aided by a grant from the Medical Research Council.
† Assisted by the British Empire Cancer Campaign.
‡ The description "ophthalmic form of Graves's disease" is preferred to "exophthalmic ophthalmoplegia" (Brain and Turnbull 1938) for such cases; it affirms their membership of the class Graves's disease and is also applicable when lid retraction and proptosis occur without ophthalmoplegia.
§ P is less than 0·01 in each case.

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of Graves's disease. A value of 6 mm. may be taken as the approximate upper limit of asymmetry in Graves's disease, but this is exceeded in four-fifths of orbital tumours. It is possible, by comparing the proptosis present with that produced by retrobulbar injection of measured volumes of wax, to estimate the size of orbital tumours.

We are grateful to Dr. S. P. Meadows, Mr. Harvey Jackson, and Mr. P. M. Moffatt for referring to us patients relevant to this work.

REFERENCES

Brain, W. R., Turnbull, H. M. (1938) *Quart. J. Med.* **7**, 293.
Ellett, E. C. (1941) *J. Amer. med. Ass.* **116**, 1.
Rundle, F. F., Pochin, E. E. (1944) *Clin. Sci.* **5**, 51.
— Wilson, C. W. (1944) *Ibid.* **5**, 31.

RADIOLOGICAL DIAGNOSIS OF MYOCARDIAL INFARCTION

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RADIOLOGISTS have long sought for a graphic record of normal and abnormal cardiac pulsations, realising that such records would be of great value in the diagnosis and prognosis of atypical cases of myocardial infarction. Cineradiography and X-ray kymography have, for various technical reasons, been disappointing. Screen observations have also yielded relatively little information. Parkinson in 1933 regretted that so little had resulted from screen examination, and White (1931), while noting that diminished pulsation of the left cardiac border might indicate myocardial weakness, pointed out that similar diminished pulsation could be seen in many other cardiac abnormalities such as concretio cordis, mitral stenosis, and rotation of the heart.

The development of brighter screens and the use of fine focus tubes with a fine grid for fluoroscopy has vastly improved the screen image, and recent work suggests that infarction can now be diagnosed accurately in a high proportion of cases. Master (1939) describes a local diminution, absence, or reversal of movement of the left ventricular silhouette in the infarcted area, and found one or other of these changes in 66 out of 100 cases of infarction. The abnormal pulsation was commonly noted in the apical or supra-apical portion of the left ventricular outline. Master considered that the abnormality, if visible in the postero-anterior view, represented an anterior or posterior infarct, while if it was seen in the left oblique or lateral view it represented a posterior infarct. In a later paper he concludes that the postero-anterior view will show, in 75% of cases, the altered heart movements which indicate that infarction has occurred, whether it be anterior, posterior, or both. Beck (1939) also describes a diminished amplitude of movement in both types of infarct. Levene and Lowman (1941), in addition to alteration in pulsation, describe a loss of convexity of the left cardiac border in typical cases of infarction. In cases checked by autopsy, they claim 85% accuracy for X-ray screen diagnosis, and 73% correct localisation, whereas the electrocardiographic findings agreed with the autopsy report in 95% and 54% respectively.

In order to estimate the value of the method, 27 patients who had certainly or probably sustained infarcts and 10 controls were examined by fluoroscopy. The screen examination was made without any previous knowledge of the history or clinical or electrocardiographic findings, and since the patients were ushered one after another into a darkened room it was not possible for the observer to be biased by the facies or apparent age of the patients.

The left ventricular border was examined in the postero-anterior view, or with slight rotation to the left, and again in the left anterior oblique, or in such an approximation to it as would secure the clearest view.

No account was taken of an altered heart shape, but diminution, reversal, or absence of pulsation was noted. If one of these was seen in the postero-anterior view an anterior infarct was presumed; if in the left oblique, a posterior infarct was diagnosed. No more accurate localisation than this was attempted. No search was made for auricular infarction, though this may evidently occur in 17% of all cases of infarct (Cushing et al. 1942).

It was later realised that the left oblique view was not the best in which to look for a posterior infarct, for this lesion seems to show itself as often as not in the postero-anterior. Also the greater amplitude of movement normally seen in the left oblique position makes it more difficult to detect local changes. In both views the apical and supra-apical regions were particularly observed.

The first group consisted of 14 patients with positive clinical evidence of infarction, confirmed by ECG findings with localisation of the site. It is clear from the results compared in the table that the fluoroscopic diagnosis of anterior infarction is accurate, but that both the site and the occurrence of a posterior infarct are more difficult to define. It seems also that the lapse of time does not affect the possibility of X-ray diagnosis, provided the infarct has been large enough.

The second group consisted of 6 patients with a history of infarct, but in whom the ECG records showed either auricular fibrillation or bundle-branch block. Deductions as to the reliability of fluoroscopic diagnosis cannot be made on such a small number and further observations are desirable. It is obvious that accurate X-ray diagnosis would be of great value in the obscure cases of fibrillation due to infarction.

Group 3 consisted of 7 patients in whom either the history or the ECG findings were equivocal. This group again shows that X-ray diagnosis is more reliable in anterior lesions, which, in any case, are more likely to show convincing ECG findings. It is clear, however, that X-ray diagnosis can be of great value in cases of infarction masquerading as dyspepsia or a biliary attack.

RESULTS OF FLUOROSCOPIC DIAGNOSIS COMPARED WITH CLINICAL AND ECG FINDINGS

Group	No. of cases	History	ECG	Time since infarct (yr.)	Fluoroscopic diagnosis			
					Ant.	Post.	Both	Neg
I	9	Positive	Q1t1	2/12-7	8	..	..	1
	5	Positive	Q3T3	8/12-9	1	1	..	3
II	4	Positive	BBB (2 common, 1 uncommon, 1 concomitant)	8/12-1	1	..	2	1
	2	Positive	Aur. fib.	3/12-1	1	..	..	1
III	2	Possible	Probable (T3)	..	1	..	1	..
	2	Probable	Probable (T3)	..	..	1	..	1
	3	Negative	Possible (T1)	..	2	..	..	1
IV	6	Various cardiac abnormalities	Negative	..	1	..	..	5
	4	Normal	Negative	..	..	..	..	4

The fourth group consisted of 6 patients with cardiac abnormalities other than infarction and four normal subjects. It was difficult to explain why in this single case an anterior infarct had been surmised. There was a slight left ventricular enlargement, but no clinical or electrocardiographic suggestion of infarct. The 4 normals gave no difficulty.

The small experiment seems to show that anterior infarction can be diagnosed and localised accurately by fluoroscopy. The alterations in the movements of the heart seem to be sufficiently pronounced, in most cases, to permit of accurate diagnosis. These alterations are probably contributed to by a thickened or adherent pericardium at the site of infarct. It is probably wrong to look for the signs of a posterior infarct in the left anterior oblique position.

If experience by other workers confirms our findings, the fluoroscopic diagnosis of infarction will be a most useful addition to other methods of investigation in the many cases showing inconclusive clinical and ECG evidence.

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SUMMARY

Twenty-seven patients with certain or probable myocardial infarction were examined fluoroscopically, without knowledge of either the history or the ECG findings.

In a large proportion of cases in which an anterior infarct had occurred the correct diagnosis was made. In cases of posterior infarct success was limited. In ten control cases, one positive and almost certainly incorrect diagnosis of infarct was made.

REFERENCES

Berk, L. H. (1939) *NY St. J. Med.* **39**, 672.
Cushing, E. H., Fell, H. S., Stanton, E. J., Wartman, W. B. (1942) *Brit. Heart J.* **4**, 17.
Levene, G., Lowman, R. M. (1941) *Radiology*, **36**, 259.
Master, A. M. (1939) *J. Mt Sinai Hosp.* **6**, 18.
Parkinson, J. (1938) *Brit. J. Radiol.* **6**, 72, 741.
White, P. (1931) Heart Disease, New York and London, p. 184.

SUDDEN DEATH AFTER INTRAVENOUS NEPTAL

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IN the past three years there have been several sudden deaths after intravenous injection of a mercurial diuretic. In a review of the toxic manifestations associated with mercurials, De Graff and Nadler (1942) show that general reactions of varying severity are not uncommon, whereas the number of sudden deaths reported is extremely small, considering the widespread use of these drugs. Evans and Perry (1943) found records since 1931 of 15 sudden deaths attributable directly to the injection of a mercurial and themselves described 6 further cases. The condition of all these patients was such that death was quite unexpected.

CASE-RECORD

A woman, aged 45, was admitted to the Western Infirmary, Glasgow, on Oct. 14, 1941. Five weeks previously she contracted a chill, but thought little of it, staying in bed for a forenoon only. A week later swelling of the face and legs appeared and became progressively worse. No blood was seen in the urine by the patient or her doctor. The past history was not relevant.

On admission the patient was not deemed acutely ill. There was severe general œdema and ascites was present. The heart was not enlarged and the systolic blood-pressure, from admission till the day before death, ranged from 110 to 132 mm. Hg. The fundi, lungs and nervous system were normal. The diet throughout supplied 1800 calories daily with 60 g. of protein and 2–3 g. of sodium chloride. The results of laboratory investigations on blood chemistry and renal function were as follows.

Date	Plasma-proteins (g. per 100 ml.)		Blood-urea (mg. per 100 ml.)	Urea-clearance (% of av. normal)
	Alb.	Glob.		
Oct. 16	1·71	1·69	36·3	87·5
Nov. 7	2·30	2·37	43·4	53·5
Nov. 21	2·20	2·15	53·0	75·0
Dec. 2	1·44	2·29	50·0	85·0

Plasma cholesterol was estimated once, the value being 926 mg. per 100 ml. The urine contained much protein, over 2% on several occasions. Casts were scanty and no red blood corpuscles were observed.

For the first 9 days in hospital treatment was confined to restriction of salt and fluid. During this time the urine was not accurately measured but œdema was considered to have increased because of a gain in weight of 1·0 kg. After a preliminary intravenous injection of 0·5 c.cm. of 'Neptal,' which caused no diuresis, during a period of 13 days six injections of 2 c.cm. were given. At the end of that time 5·0 kg. of weight had been lost and the œdema was much less. On each occasion the neptal was diluted to 10 c.cm. with normal saline and there were no toxic reactions of any kind.

It was then decided to try the effect of urea, and for the next six days no diuretic was given. The urinary output fell and œdema increased, as shown by a gain in weight of 0·9 kg. Urea was then administered in dosage of 10 g. four times a day. At first there was considerable nausea, but this soon passed off, and after 8 days the dose was increased to 15 g. of urea four times a day. Although the mean volume of urine per 24 hours was about double that for the period when no diuretic was being given, œdema progressively increased, as shown by the weight curve. It was accordingly decided to resume treatment with neptal. Urea was stopped and three days later 2 c.cm. of neptal was given in the same manner as the earlier injections. Within a minute the patient became distressed, throwing up her hands and crying out. Respirations became laboured and cyanosis appeared. Within a few seconds a generalised convulsion began, which lasted about 30 seconds. After this she remained unconscious, with stertorous breathing and intense cyanosis. The pulse could not be felt. Death took place about 3 minutes after the start of the injection. Adrenaline, coramine and hot packs applied to the præcordium were ineffective. Permission for an autopsy was not granted.

Treatment	Duration of treatment (days)	Mean vol. of urine per 24 hr. (c.cm.)	Weight (kg.)	
			Start of period	End of period
Neptal ..	13	833	74·1	69·1
No diuretic	6	271	69·1	70·0
Urea ..	17	573	70·0	71·4

Salt restricted throughout. Fluid intake 1200 c.cm. daily.

To summarise, this woman with renal œdema and very low plasma-proteins received six injections of neptal intravenously in 13 days. There were no reactions and fair diuresis was obtained. After an interval of 23 days, treatment with mercurials was resumed and the patient died immediately after the first injection of the second course. It is not considered that the large doses of urea given during the interval between the courses of neptal played any part in the fatal reaction. The sequence of events is in keeping with the view that death is due to an acquired sensitivity to mercury. (Tyson 1941). However it should be noted that if this is the explanation of the deaths, sensitivity to mercury must have been acquired otherwise than by injection of a mercurial diuretic in 2 of the 22 recorded cases (Sunderam 1934, Barker et al. 1942), for in these the patient died after the first injection.

REFERENCES

Barker, M. H., Lindberg, H. A., Thomas, M. E. (1942) *J. Amer. med. Ass.* **119**, 1001.
De Graff, A. C., Nadler, J. E. (1942) *Ibid*, **119**, 1006.
Evans, H., Perry, K. M. A. (1943) *Lancet*, **1**, 576.
Sunderam, S. K. (1934) *J. Amer. med. Ass.* **103**, 60.
Tyson, M. C. (1941) *Ibid*, **117**, 998.

CASE OF RABIES IN MAN

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MAJOR IAMC

THE leading article in THE LANCET of Nov. 11, 1944, on the menace of rabies must have been read by many of us who have been abroad with a sense of gratitude to those who framed the quarantine regulations by which the disease has been stamped out in England. It has prompted me to describe the following case of human rabies which occurred in India some years ago and of which I took careful notes at the time.

On Jan. 1, 1939, a number of people were attacked by a mad dog, among them a young Gurkha rifleman aged 19. He had severe lacerations on his left knee and was admitted to hospital. Next morning he and the others who were bitten were put on a course of antirabic treatment consisting of 14 daily injections of 5 c.cm. of antirabic vaccine. On the 14th he was discharged from hospital, the wound on the knee having healed. The dog in the meantime had been killed and Negri bodies were found in its brain.

On Feb. 16 he was again admitted to hospital with a history of fever and pains in his legs from the hips to the feet for about 24 hours before admission. He also complained of burning pain on micturition and of passing very small quantities of urine at a time. He had been constipated for 3 days. The NCO who brought him to hospital also remarked that he had been unsteady on parade that day.

On admission he had a temperature of 102° F and a pulse-

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rate of 120 per min. His chest and heart were normal and his nervous system showed no abnormality except sluggish knee-jerks. His bladder was distended up to the umbilicus, there was priapism and a thin serous urethral discharge which contained spermatozoa. His urine was normal and his blood-urea was 54 mg. per 100 c.cm. Soon after admission he passed urine without assistance.

His condition remained stationary for about 24 hours, but on the morning of Feb. 17 deterioration set in. His temperature was now 101° F. His conjunctivæ were congested and he began to vomit his feeds. He was now unable to move his legs and examination of his nervous system revealed absent knee-jerks and abdominal reflexes. His plantar response was flexor and there did not appear to be any sensory changes. His mind was quite clear and he answered any questions that were put to him and was very coöperative. He had by this time become very apprehensive and went into slight generalised convulsions with severe spasms of the face and neck muscles when attempting to drink. He did however complain of thirst. At this stage he was diagnosed as rabies and was isolated. No further attempts were made to feed him by mouth and 10% glucose in normal saline was administered by rectum. He could not pass urine voluntarily and was catheterised when necessary. Morphine gr. ¼ was given and was sufficient to prevent any further spasms for the rest of that day and the following night.

By the next morning, Feb. 18, his condition had greatly deteriorated. He could not speak clearly or answer questions. He moved his hands about purposelessly and was cold and collapsed. Examination revealed a complete flaccid paralysis of the legs with absence of reflexes. The abdominal and arm reflexes were absent. His pupils were unequal, dilated, irregular, and did not react to light. Priapism was still present and had been present throughout the illness. Anti-shock treatment resulted in a temporary improvement in his general condition, but by 5.30 PM he was comatose. His temperature was subnormal and his pulse-rate 40. Cardiac stimulants had no effect. Cheyne-Stokes respiration set in and he died at 7.15 PM. No autopsy was permitted.

COMMENT

In this case of rabies the main clinical feature was an ascending paralysis of the Landry type. The case is of interest in that the patient was seen immediately after being bitten by a rabid dog and was given a full course of antirabic treatment. There was some doubt at one time during the illness whether the patient was suffering from the Landry type of paralysis which may occur as a rare complication of treatment with antirabic vaccine,[1] but in view of the convulsions on attempting to drink the case was considered to be one of rabies. A report was sent to the Pasteur Institute, Kasauli, which agreed with the diagnosis.

It is to be noted that the five or six other people who were attacked by the same dog, received less severe bites, and were given the same course of antirabic treatment, suffered no ill effects whatsoever.

1. See Price's Textbook of the Practice of Medicine, 1942, p. 1588.

Reviews of Books

Textbook of Anæsthetics

(6th ed.) R. J. MINNITT, MD LPOOL, DA, JOHN GILLIES, MC, MB, CH B EDIN., DA. (Livingstone. Pp. 487. 25s.)

IN this up-to-date survey of a now important specialty, the authors have made the text useful, not merely to the examinee but to the inexperienced beginner. Accounts of various techniques and instruments are packed with practical details. Sound advice, born of long experience, is given liberally. Particularly good chapters deal with obstetric and endotracheal anæsthesia; and the account of the standard gas-oxygen-ether machines, and the technique used in this country, is probably the best in English. There are, of course, some minor imperfections. It would be rash of a novice to attempt to produce regional anæsthesia after reading the short descriptions given, and a few physiological points also need revision. The authors are ardent advocates of the virtues of rebreathing. That we all thrive on fresh air, and that carbon-dioxide-absorption anæsthesia is widely practised with safety, should surely prove that it is not necessary to breathe carbon dioxide in order to avoid acapnia.

Clinical Laboratory Methods and Diagnosis

(3rd ed.) R. B. H. GRADWOHL, MD, D SC. (Kimpton. Pp. 2130. 2 vols. £5.)

THE second edition of this well-known textbook was bulky; thanks to additional girth it has undergone binary fission, but even the daughter volumes are large, over 1000 pages each. The first deals with urine, blood chemistry, hæmatology, blood-groups, gastric and duodenal analysis, puncture fluids, and a variety of special tests; volume II covers bacteriology and serology, estimation of basal metabolism, autopsies, histology, forensic medicine, parasitology and tropical medicine. The use of the photo-electric colorimeter is fully described in the new edition, and the section on tests of liver function is new and good. The hippuric acid test is considered to be purely a test of excretory function and not a substitute for the lactose- or galactose-tolerance tests. The section on blood-groups is informative on the Rh factors, and illustrated by instructive diagrams to explain inheritance. The fluorescent technique, in which auramine staining and ultraviolet light are used for the rapid detection of tubercle bacilli, is described in detail, and a new section on vitamin assay and identification is included. An account of penicillin, justly described by the author as terse, occupies a single page. In a section on various pregnancy tests emphasis is laid on the use of *Xenopus* (South African horned toad); Dr. Gradwohl thinks this method has notable advantages if you can get plenty of toads. The section on histological technique is comprehensive, and the chapter on parasitology, including helminthology, has been revised in collaboration with Dr. Pedro Kourí of the University of Havana, with outstandingly good results. The revised section on hæmatology still contains too much doubtful matter; the place of the megaloblast is left uncertain, and colour plates showing this cell are mostly inaccurate. Claims for prognoses in infections based on the "hemogram" give an exaggerated idea of what a blood examination can tell. When giving methods of investigation it is useful to say which is considered best, and what are the special advantages and snags of each; for instance it would be helpful if Dr. Gradwohl indicated which of the five methods of blood-sugar estimation is used in his own laboratory, and why. Laboratory workers will be grateful for this new edition but will probably hope that, in the next, ruthless excision of out-of-date and redundant material will keep down the size of the two volumes.

Psychophysiologische Probleme in der Medizin

Prof. Dr. med. WALTER H. v. WYSS, Chefarzt der innern Abteilung des Krankenhauses Neumünster Zollikerberg, bei Zürich. (Schwabe. Pp. 207. Sw. Frs. 14.)

THIS book attempts to set out a philosophy of human nature from the physician's point of view. Dr. Wyss aims at reconciling the most disparate ideas—the physicochemical interpretation of life with vitalism, body-mind unity with man paramount in nature through his psyche. His eclecticism gives him a broad road. He does not pause before gaps in our knowledge or difficulties in explanation: psychosomatic relations, vegetative and hormonal regulations, which to the ordinary student seem full of snares, fit smoothly into his concept of the whole. Diseases are enemies which the patient is well equipped to fight: he will conquer, unless the problem of his existence seems better met by surrender. The result is a pleasing and comforting picture of man in nature. As for the method by which this harmony is achieved, some translations from the chapters on respiratory, digestive and secretory functions may serve to illustrate the author's point of view: "Respiration is an important medium for expressing affective tension. In it freedom and coercion meet." "Hunger and satiety in man are the equivalents of poverty and possession, of social restlessness and the sense of power." "The mental equivalent of kidney function is reliability and conscientiousness." The physiological facts are up-to-date, sometimes based on the very latest researches; but the book lacks the intellectual responsibility which prevents science from becoming the tool of politicians.

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THE LANCET

LONDON: SATURDAY, JANUARY 13, 1945

Penicillin in Gas-Gangrene

BOTH the incidence and case-mortality of gas-gangrene among our land forces in Western Europe have in the first few months since D-day been considerably lower than was anticipated. Credit for the relative success against this most fatal of wound infections belongs to a number of factors which cannot easily be disentangled. Rapid evacuation of the wounded, early and radical surgery, penicillin and sulphonamides prophylactically and therapeutically, gas-gangrene antitoxin—all must claim a share in the praise. Yet experienced surgeons agree that the most important single factor in the control and cure of gas-gangrene is still good surgery: thorough removal of dead and devitalised tissue as soon as possible after wounding, and radical excision of infected tissue when gas-gangrene is apparent or suspected. Most of the cases have developed in wounds where the main artery has been divided and the muscles beyond have been ischæmic. In such circumstances early amputation may be the best surgical treatment.

The rôle of penicillin in the prevention and cure of gas-gangrene is not going to be easy to determine. Experimentally penicillin has proved superior to the sulphonamides. Following the encouraging results reported by MCINTOSH and SELBIE,[1] HAC and her associates[2] have tested the therapeutic value of sulphonamides (particularly sulphathiazole and sulphadiazine), tyrothricin, zinc peroxide, and penicillin on experimental gas-gangrene in mice. Infection of muscle was apparent an hour after injection of a culture of *Cl. welchii*, and at this stage penicillin in repeated doses of 5–25 units gave 92–96% cures, whereas sulphadiazine saved 48% and sulphathiazole 20%. The survival-rate with penicillin given three hours after infection was 38%, against only 10% with the sulphonamides. Sulphadiazine was the most effective drug prophylactically. Neither tyrothricin nor zinc peroxide, applied locally, had any therapeutic value. The mouse is not, perhaps, the best test animal for experimental gas-gangrene, but HAC obtained equally good results with penicillin in a small series of experimentally infected guinea-pigs.

In the special penicillin issue of the *British Journal of Surgery*, JEFFREY and THOMSON[3] analyse their experience with penicillin in 33 cases of gas-gangrene in Italy in the spring of 1944. Five of these were men beyond surgical aid when first seen, and although they were given penicillin and antitoxin all 5 died. Of the remaining 28, 7 died (25%), a case-mortality which compares favourably with the earlier report of MACLENNAN and MACFARLANE[4] when 12 of 35 cases receiving adequate treatment (early surgery, antitoxin, and sulphonamides) died (35%). JEFFREY and THOMSON usually gave the penicillin in intramuscular injections of 15,000 units 3-hourly over 3–5 days, the average dosage for the survivors being 370,000 units. They recommend a 3-day course for the case where all devitalised tissue has been removed, but where this is impossible therapy should be continued for 5–10 days. For the shorter course intramuscular injections are probably preferable, while an intramuscular or intravenous drip should be used for the treatment of cases over longer periods. In early trials the intramuscular 'Eudrip' apparatus has unfortunately not proved suitable for field conditions; Army surgeons have found that the daily dose of penicillin is best given by intramuscular drip in 500 c.cm. of saline using the standard transfusion set, and that patients will often coöperate in controlling the rate of flow. JEFFREY and THOMSON were convinced of the value of penicillin in checking the spread of the infection, although clinical improvement was often not obvious until 36 hours after commencement of penicillin therapy. In the fatal cases there was post-mortem evidence of arrest of the gangrenous process with a fibroblastic barrier at the junction of dead and healthy muscle, and death was mostly attributable to other causes—e.g., uræmia, septic bronchopneumonia, myocarditis, or secondary hæmorrhage. All their patients had, of course, been given antitoxin therapeutically, and 10 had had prophylactic polyvalent antitoxin in doses of 16,500 to 49,500 units. They believe that under optimal conditions the fatality-rate of gas-gangrene should not exceed 20%. In the same issue CUTLER and SANDUSKY[5] report 5 cases of clostridial infection which developed despite the prophylactic use of penicillin. These infections all occurred in airmen, and the source of the clostridia was probably their flying suits. Some of the patients showed only localised infection and it is doubtful whether they were really cases of gas-gangrene modified by penicillin or were cases of anaerobic cellulitis, which according to a recent Canadian memorandum[6] responds well to penicillin-sulphonamide therapy. The important point is that all 5 recovered, which encourages the belief that if prophylactic penicillin cannot prevent gas-gangrene it at least modifies the infection, partly, it must be supposed, by direct attack on the clostridia and partly by preventing the growth of other bacteria which predispose to gas-gangrenous infection.

Nerve Homografts

"HOMOGRAFTS" are grafts transplanted from one individual to another of the same species: from man to man, for example, or rabbit to rabbit. Homografts of bone and cartilage, tissues largely built of matter which may be serologically inert, have a small but useful place in orthopædic and plastic surgery. Homografts used in skin-grafting, where everything depends on the survival and proliferation of the foreign cells, are (as the underwriters say) a total loss. Where does the nerve homograft lie between these two extremes? If the nerve graft were essentially an inert tubular collagenous scaffolding and the mere medium for a tissue-culture in vivo of cells from the two nerve stumps which it indirectly unites, then we should be justified in expecting great

1. McIntosh, J., Selbie, F. R. *Lancet*, 1942, ii, 750; 1943, i, 793.
2. Hac, L. R., Hubert, A. C. *J. infect. Dis.* 1943, **74**, 150, 161, 164.
3. Jeffrey, J. S., Thomson, S. *Brit. J. Surg.* 1944, **32**, 159.
4. MacLennan, J. D., Macfarlane, M. G. *Brit. med. J.* 1944, i, 683.
5. Cutler, E. C., Sandusky, W. R. *Brit. J. Surg.* 1944, **32**, 168.
6. Penicillin: A Guide for its use in the Canadian Overseas Forces. Issued by the Overseas Joint Services Penicillin Committee, 20, Lincoln's Inn, London, WC2.

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things of it. But if, on the contrary, the surviving cells of the graft itself play a critically important part in securing functional reunion, then we may have to steel ourselves to disappointment.

The only reason for considering nerve homografts is that they offer a possible escape from the principal dilemma of peripheral nerve surgery. Traumatic division of a nerve is never so clean that the divided stumps can be brought together without resection of the damaged ends. If much resection must be done in order to expose "healthy bundles," the stumps cannot be united by suture except under tension, varying in degree with the length of gap to be bridged and the extent of mobilisation. But tension in this situation has a number of undesirable consequences, only one of which is the abnormally dense collagenisation of the nerve [1 2]; and end-to-end suture under tension exchanges new lesions for those it repairs. A second possibility is to use nerve "autografts"—grafts taken from another part of the same individual. But as a rule such grafts are simply not to be found: what nerve, for example, is to be sacrificed if the sciatic or median is to be repaired? If an autograft is contemplated, it can usually only take the form of a cable composed of four or five strands of some relatively unimportant cutaneous nerve; and this introduces a new difficulty, only recently brought to light [3]—namely, that the endoneurial tubes in grafts of cutaneous nerves may be too narrow to allow the effective maturation of large motor fibres. A third possibility is to make use of some variant of *suture à distance*. We have just been told [4] that LISTER suggested such a method—a to-and-fro union of the stumps by parallel strands of fine catgut, which the nerve-fibres are expected (not wholly without reason) to regard in the nature of tramlines. Other such expedients, including tubes and flaps, have been examined and unfavourably reported on by SANDERS.[5] The most up-to-date version of the tube is WEISS'S arterial sleeve,[6] though this was designed for sutures in which no very great gap is to be bridged. Their clinical trial is yet to come.

The homograft remains. Here there is no problem of supply, for an amputated leg or fresh cadaver will supply the graft which the patient himself can hardly spare; but over and above the difficulties and drawbacks associated with the use of grafts as such (no doubt principally bound up with the uncertainty or incompleteness of vascularisation, where the grafts are large) the homograft introduces the additional variable of "tissue incompatibility." SANDERS [5] and SANDERS and YOUNG [7] have reviewed the attempts which have been made to use nerve homografts in man and in experimental animals. The results are neither very encouraging nor decisively bad. In rabbits at least, [7 8] it is possible to secure a moderately effective functional recovery of nerves which have been repaired by a homograft bridge 2 cm. long. Moreover, the storage of nerves under petrolatum or in Ringer's solution, first introduced as a measure of convenience (since a donor, alive or recently dead, may not always be to hand), may actually be beneficial. The storage of nerve may progressively thin out the number of living and therefore serologically active ingredients of the foreign nerve, but yet preserve a sufficient number to perform the task of mediation. WEISS [9] has lately carried the technique of storage to its logical conclusion: he believes that snap-frozen and dried nerve grafts preserve the gross and fine morphological properties of nerve although the cells within them are dead. The frozen-dried graft is probably the nearest approach that can be made to a perfect scaffold for nerve union; and if a scaffold is all that is required for the long and wide defects which the nerve surgeon is obliged to repair, the method may have a great future before it.

Recent reports upon the use of fresh, or more or less fresh, human nerve homografts may have given the layman some ground for optimism. It must at once be said, therefore, that some of these reports are either devoid of significance or unreliable. Either they are inadequately documented or the evidence contains the substance of their own refutation—for instance when success is claimed on a basis of as little as three months' follow-up. The matter has now been reinvestigated by SEDDON and HOLMES [10] in a report based on three cases, two of which were treated with fresh homografts, and the third with a homograft stored in Ringer's solution before use. In these no hint of recovery was found after periods of 371, 425, and 573 days. The homografts were removed and examined histologically. The remains of the two fresh homografts had been grossly collagenised and nothing remained of the original nerve elements. The stored graft had provoked a foreign-body reaction and was in process of removal by phagocytes. In summary, the histological report is a death sentence: "there was clearly no sign or even possibility of regeneration." From this SEDDON and HOLMES proceed to ask why nerve homografts are evidently more successful in animals than in man, and their hypothesis, which follows, is to receive experimental investigation. They accept the view [11] that homografts of nerve, as of skin, provoke an active immune reaction, which is preceded by a latent period (during which their behaviour is autograft-like) and which varies in intensity with the quantity of tissue grafted. In homografts of small animals, the "colonisation" of the graft by nerve-fibres from the recipient may take place within the compass of this latent period: the fibres get home, so to speak, just before it starts to rain. But with the long fat homografts of human beings the case is otherwise. Here the fibres may be caught half-way through the graft, when the cellular reaction begins around them. It should be noted that this interpretation does not turn on the phenomenon of graft dosage, but purely upon the absolute size, or perhaps length, of the graft. It leaves open the possibility that a carefully graded extinction of the life of the cells in the graft by storage or by sublethal narcosis may overcome the difficulty, by reducing the antigenic power and effective dosage of the graft, and so lengthening the latent period during which its behaviour is substantially autograft-like.

1. Highet, W. B., Holmes, W. *Brit. J. Surg.* 1943, **30**, 212.
2. Highet, W. B., Sanders, K. S. *Ibid*, p. 355.
3. Gutmann, E., Sanders, K. S. *J. Physiol.* 1943, **109**, 489.
4. Cameron, H. C. *Lancet*, 1944, **ii**, 833.
5. Sanders, F. K. *Brain*, 1942, **65**, 281.
6. Weiss, P. *Arch. Surg.* 1943, **46**, 525.
7. Sanders, F. K., Young, J. Z. *J. Anat.* 1942, **76**, 143.
8. Gutmann, E., Sanders, F. K. *Brain*, 1942, **65**, 373.
9. Weiss, P. *Proc. Soc. exp. Biol., N.Y.* 1944, **54**, 277.
10. Seddon, H. J., Holmes, W. *Surg. Gynec. Obstet.* 1944, **79**, 342.
11. Gibson, T., Medawar, P. B. *J. Anat.* 1943, **77**, 299; Medawar, P. B. *Ibid*, 1944, **78**, 176.

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Whether SEDDON and HOLMES are right or not, their interpretation illustrates a principle important for the appraisal of experimental results. Nothing could be easier than to summarise the foregoing evidence by saying that homografts are adequate in experimental animals but useless in human beings, and that this only goes to show (" what I have always said," &c.) that experimental surgery on laboratory animals is a waste of everybody's time. On the contrary, they accept the differences between the behaviour of homografts in animals and in man; they believe the differences to be significant, and susceptible of precise analysis; and they believe that the nature of these differences may well provide the clue which will in the long run make it possible to use nerve homografts in human beings.

Structure of Local Government

A NEW white-paper on local government in England and Wales during the period of reconstruction is summarised on another page. Its proposals are not decisions, but are put forward in the hope that the legislation which will follow their discussion will be largely agreed, with a resultant strengthening of the framework of local government to bear greater responsibilities and to fulfil new tasks. Emphasis is properly laid on the fact that local government is a living organism, already proved capable of adaptation to meet new conditions and varied responsibilities, and that its success depends on attracting administrators, both members and officers, of the right calibre, and giving them proper scope.

The responsibilities of local government are already heavy. Water, lighting, housing, drainage, scavenging, health, hospitals, and education form the main limbs of a permanent skeleton to which have been added national registration, food rationing, civil defence, evacuation and reception, and the repair of war damage. These many-sided activities have an inescapable bearing on the health and comfort of every citizen, and while there have, on occasion in a few places, been shortcomings, they have on the whole been carried out with an undramatic efficiency. The " town hall," more than ever before, has become a factor in the conscious life of the citizen, particularly in areas which have been the object of enemy attention. It is clear that the period of reconstruction will add to these duties of the local authorities. Town and country planning and the control of new development, vast extensions in the fields of housing, education, and health, and coöperation with the central government in the timing and execution of a programme of capital expenditure to help employment policy, are measures to which the nation is committed—measures whose day-to-day execution will be largely in the hands of the local authorities. In 1941 these bodies had an income and incurred an expenditure in the region of £660 millions [1]; of this huge sum £204 millions came from rates, £226 millions from Government grants, and £233 millions from other sources, mainly trading services. Education expenditure as a result of the new Act will in due course be more than double the pre-war figure, as will expenditure on health—almost all the increase coming from national resources. Facts such as these illustrate the importance of efficient local-government machinery. The white-paper examines the various alternative systems—nationalisation, regionalisation, or a continuation of the present system of counties and county boroughs as the major authorities, with joint authorities for services such as town and country planning and hospital services which require coördination over wider areas. It comes down in favour of the present major authorities, plus joint authorities for the wider services, as the best means of tiding over the reconstruction period; but it adds the warning that the proposals are experimental and that experience " may disclose the need of more radical alteration of the local government structure."

The need for machinery for the adjustment of local-government areas remains. Overspill from towns, the establishment of new industries in hitherto sparsely populated areas, and the decline of established industries and consequent fall of population in other districts all necessitate periodic revision of boundaries. Since 1926 it has been impossible to create new county boroughs, or extend the boundaries of existing county boroughs, except by private Act of Parliament. In counties, since 1929, the county council has had the statutory duty of reviewing county district areas, the decisions being confirmed, with or without modification, by the Minister of Health. The first review had been completed by 1937 and further reviews were to take place at ten-year intervals; but the war led to a statutory suspension of further adjustment of local-government areas. We may expect that in the near future counties will begin their second review and county boroughs will commence proceedings for extending their boundaries. Both types of authority will, meanwhile, be engaged in various forms of planning—on housing, health, and education, for example—without any sure knowledge of the area for which they will be responsible. To avoid this situation the Government propose the establishment of a Local Government Boundary Commission of not more than five commissioners, with the necessary staff, whose duty it will be, subject to certain safeguards, to examine all proposals for boundary adjustment, whether of counties, county boroughs, or county districts. This commission will normally work by reviewing each geographical county and holding a local inquiry on the request of the Minister, the county council, or any county-borough council affected.

The white-paper details two special problems. The first is that of Middlesex, which is entirely urban and in which combinations of the constituent boroughs or urban districts could result in a series of county boroughs which would remove the whole area from the administrative county and destroy the county government. The commissioners, therefore, may not entertain applications for county-borough status from authorities in this county. The second is the problem of local government in London, where two issues arise—namely, whether the boundaries of the county should be extended and whether, within the county, the number and the areas of the 29 boroughs (including the City) and the allocation of functions between the county council and the borough councils are satisfactory. We commented recently on this very complex issue,[2] which the Government proposes to leave to an authoritative body to be specially

1. Ministry of Health Report for year ended March, 1944 (Cmd 6562).

2. *Lancet*, 1944, ii, 55.

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appointed to "inquire into and advise them on the local government problems *within* the county." The problem of Greater London is shelved in view of the urgency of the problems of reconstruction.

Local government is increasingly run on political lines, candidates for membership being nominated by the local political parties who are also concerned in the election of parliamentary candidates. This means that on issues of local importance great political pressure can be brought to bear on members of Parliament, particularly where the local authorities think alike on any issue. The reactions of local authorities to the Government's proposal that joint health authorities should administer hospital services was vigorously adverse. The present white-paper indicates that the local-government associations were unanimously opposed to the creation of regional authorities. These facts may have influenced the Government in their decision in favour of the present major authorities, together with joint authorities for certain services, as being the most suitable for the period of reconstruction. More radical alterations may prove necessary. But local government, like national government, is an art involving the handling of human beings with likes and dislikes, passions and prejudices. The system of continued responsibility of existing authorities and of boundary revision which is proposed may be a compromise solution to placate the potential opposition of these authorities, but it is workable and it does remove this difficult question from the political arena. Areas will henceforth be determined by impartial experts in the light of all the evidence and in the light of community needs and community services. The expense and the waste of time involved in a full hearing of evidence a second and even a third time by appeals to the Houses of Parliament will be avoided. The collective needs of civilised communities appear to be given a reasonable chance of collective satisfaction. And in the course of time, doctors, who have collectively foresworn any acceptance of local-authority control of medical practice, may recognise that, in their sphere also, local government can make a contribution of value.

Annotations

ACTION AGAINST RHEUMATISM

THE pledge of the Government to provide for every sick person treatment according to his needs has not faltered before the prospect of treating over a million sufferers from rheumatism in England and Wales alone. This is perhaps the most important item in Lord Horder's message in the eighth annual report of the Empire Rheumatism Council.[1] The Minister of Health has, in fact, set up a subcommittee of its medical advisory committee to consider the whole position of rheumatism treatment. Doctors with special knowledge of rheumatism are scarce at present, and the shortage is likely to continue after the war. The Empire Rheumatism Council has established a committee on postgraduate education, with Sir Adolphe Abrahams as chairman. In the council's pamphlet, *Rheumatism: a Plan for National Action*,[2] the fourth edition of which has just appeared, it is suggested that treatment centres and other medical training institutions should train specialists and establish postgraduate courses in rheumatology for general practitioners. The task of grounding the medical student thoroughly in the subject will of course still lie with the teaching schools.

In the annual report Lord Horder also notes that an investigation, admittedly limited, undertaken by Surgeon Commander C. A. Green of the council's naval research foundation, gives no encouragement to the hope that penicillin will be of service in the treatment of rheumatism. Results with the serum prepared by Bogomoletz in the USSR have also proved disappointing, but the quantities available were very small. The establishment of a national chain of treatment centres, advocated in the pamphlet, would do much to advance clinical research as well as to check the inroads of these disabling disorders.

CASTRATION OR ŒSTROGEN THERAPY IN PROSTATIC CANCER?

THE conservative treatment of prostatic cancer, which has become possible through our increased knowledge of hormonal reactions in this disease, can already be regarded as a boon to mankind. It must not yet be inferred that cancer of the prostate can be permanently arrested either by castration or by persistent administration of œstrogen; several years must elapse before any such claim could be justified. But it is certain that in many cases of prostatic cancer symptoms can be temporarily alleviated by castration or the continued use of œstrogen. The purpose of castration in this disease is fundamentally the same as that of giving œstrogen—namely, to reduce the supply of testicular androgen on which the prostate chiefly depends for its activity. Many prostatic cancers are sufficiently differentiated to retain in some degree the normal responses to hormonal stimulation. For example, they react to androgen, like the normal prostate, by secreting acid phosphatase. In health, although the prostatic epithelium and seminal fluid are rich in acid phosphatase, the enzyme is not found, except in very small quantities, in the blood-stream; and this is true also in early cases of prostatic cancer. With more extensive growths, especially when there are metastases in the bones, acid phosphatase usually appears more or less abundantly in the serum, where its presence facilitates diagnosis and provides means whereby the progress of the disease may be followed with an approach to exactitude. Apparently the presence of 5 or more units of acid phosphatase in 100 c.cm. of blood-serum is almost pathognomonic of prostatic cancer.[1] Castration, or administration of œstrogen, causes an almost immediate drop in the serum phosphatase, whereas androgen causes a prompt increase.

Although castration and œstrogens both act largely or entirely by reducing the supply of androgen, they do this in different ways. Castration eliminates the main source of androgen, while œstrogen arrests its output from the testicle by inhibiting the supply of gonadotrophin from the pituitary; also œstrogen may perhaps act to some extent as a direct antagonist of androgen. The effect of œstrogen on the pituitary is temporary and reversible; so continuity of treatment is essential; and some inconveniences are apt to accompany the continued taking of œstrogen. If the two methods are not to be used simultaneously, their relative values must be determined. Here a paper by Dean, Woodward, and Twombly[2] is of particular interest, for they have compared the results in 31 patients with prostatic cancer treated by castration with those obtained in 29 patients treated with stilbœstrol in doses of 1 to 5 mg. given by mouth. Both methods of treatment gave immediate and striking benefit; pain disappeared and general well-being rapidly improved. These changes were brought

1. Obtainable from the secretary, Sir Frank Fox, 106, Finchley Road, London, NW3. 2. H. K. Lewis. Pp. 61. 2s.

1. Sullivan, T. J., Gutman, E. F., Gutman, A. B. *J. Urol.* 1942, 48, 426.
2. Dean, A. L., Woodward, H. Q., Twombly, G. H. *Surgery*, 1944, 16, 169.

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about more quickly by castration than by œstrogen therapy. With either method it was not uncommon for symptoms to return after an interval of about 7 or 8 months; and when this happened neither castration nor treatment with œstrogen brought any further improvement. However, such relapse was not invariable, and some of the patients remained free from symptoms for two years or longer. Such an extended arrest of cancer was seen more often in patients treated with stilbœstrol than in those who had been castrated, and the former method has therefore been now selected by the authors for routine use.

FEVERS IN EVERY TONGUE

MANY of us find difficulty in interpreting the exact meaning of writers in foreign languages we know fairly well, when it comes to descriptions of communicable diseases like measles, typhoid, or anthrax. English words identical with, or very similar to, the French, Spanish, or German terms often connote quite different ideas. One has only to look at the word anthrax, which in the original Greek ἄνθραξ means charcoal, but in English a disease due to *B. anthracis*, and in France and Spain a carbuncle or conglomeration of boils. Typhus in France and England stands for exanthematic typhus, while in Germany it means typhoid or enteric fever, sometimes qualified by the adjective "abdominalis." Belgians and French-speaking Swiss also call enteric or typhoid "typhus." Even when Latin terminology is employed the fog is no less dense, for Latin names of communicable diseases are subject to different interpretations in different countries. Rubeola at times means measles (Latin, morbilli), at others rubella, röteln or German measles. From this may arise serious complications—a telegram to the Red Cross at Geneva for typhus vaccine, for example, may result in the despatch of typhoid vaccine. Errors in death certification are almost unavoidable.

Dr. Yves Biraud, head of the League of Nations service of epidemiological intelligence, has compiled a volume giving all known terms for communicable diseases in Latin and 23 modern European languages. Dr. Biraud is careful to explain that Gaelic disease-names have not been included because he considers, and justly, that English is still "one of the national languages of Eire." He does not claim that it is a complete list, and with a wise eye to future editions, invites the collaboration of the reader in supplying names which may have escaped the observation of his assistants, to whom he gives due credit. But it is the work of an extraordinarily patient and industrious compiler, whose perspicacity and discernment are evident in every page, and with its copious indices will be a godsend to the serious student, however expert a linguist he may be.

THE BATES METHOD

FEW of us would wear spectacles if we could find a way to improve bad sight without them; hence the attraction of the method devised by the late Dr. W. H. Bates is perfectly understandable. The assumptions on which he based his system were set out in a book published in 1920 (*Perfect Sight without Glasses*), and a new edition containing fewer technicalities has now appeared under the less ambitious title *Good Sight without Glasses*.[2] Bates held that the lens plays no part in accommodation, which he thought was achieved by a shortening of the globe produced by the action of the extra-ocular muscles. Refraction, he held, is constantly changing and errors of refraction are induced by restlessness or "strain." He considered, moreover, that cataract, glaucoma, and optic atrophy are also produced by strain, though of a different type. It followed that he considered glasses unnecessary, in fact harmful: "If the patient does not go on to cataract, glaucoma, or inflammation of the retina he may consider himself fortunate." Bates ignored, of course, much established clinical and experimental work. In denying the rôle of the lens in accommodation he harked back a hundred years or more, supporting his thesis by some rather crude demonstrations on the eye of a fish; though it had already been shown that the mechanism of accommodation in fishes differs from that of mammals. He also denied the action of atropine on the unstriped ciliary muscle, and ascribed its action to an effect on the external muscles though these are striated. Since atropine acts by paralysing parasympathetic nerve-endings, it is hard to see how he justified this opinion. Nor is it easy to accept an experiment in which he claimed to show that accommodation resulted from stimulating the external rectus with an electric current. This effect was abolished when the muscle was cut, but immediately reappeared when the muscle was tied up again, without any interval for regeneration of the injured muscle and nerve. He regarded refractive errors as an expression of mental restlessness, and his remarkably rapid retinoscopies convinced him that the refraction of an eye may vary from emmetropia to 20 D myopia within a second.

But if Bates's physiology and clinical observations are unsatisfactory, his work and that of his followers contains an important lesson. Ophthalmologists have not been sufficiently conscious of the truism that there are none so blind as those who won't see: by confusing the process of seeing with the act of seeing they have been apt to overlook a strong subjective element in their patients' sight. Bates and his followers do not make this particular mistake.

THE NEGLECTFUL PARENT

WHEN parents are punished by imprisonment for neglect of their children two problems are at once created—where to send the children while the parents are serving their term, and how to prevent them from neglecting the children again when they are released. Imprisonment of parents is no doubt an out-of-date method of treatment for this disorder, and any measure that would teach them to look after children properly would be more satisfactory. In the *Manchester Guardian* of Jan. 1, Miss M. Artemus-Jones suggests the establishment of small cottage institutions, run on the simplest possible lines, where mothers, taking their children with them, could be taught child care by matrons with practical experience. Neglect, as she points out, is often rooted in mere inefficiency: but the mother who is incompetent to carry out her tasks of cleaning and cooking, and lets things drift, could hardly fail to benefit by simple training in method. The father would be required to contribute to the upkeep of the family while in the training home, and perhaps to clean up the house against their return.

The proposal is attractive, though the cost of the scheme might be substantial. A more serious difficulty would perhaps be to keep the mother in the training-home without some prison-like restrictions, or the threat of prison; and this would mean associating the children with the penal aspect of their case. They could hardly fail to acquire some stigma with their contemporaries. Moreover, during the training period, those of school age would presumably have to go to the school nearest the training-home, thus interrupting their attendance at their usual school. Finally the mother might feel that the father was getting off too lightly. She is to be uprooted from her home and taught her business by a stranger, for which her neighbours will later laugh at her; whereas he gets off with cleaning the house—once.

A start might perhaps be made by giving courses in household management to mothers serving terms of

1. Polyglot Glossary of Communicable Diseases: Contribution to the International Nomenclature of Diseases. By Yves Biraud. MD. London: Allen and Unwin. Pp. 556. 4s.
2. The Bates Method of Good Sight without Glasses. William H. Bates, MD. (Faber. Pp. 159. 10s. 6d.)

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imprisonment for neglect; and if these proved successful, continuation courses might be offered for the mothers to attend after discharge. Possibly home helps with some training in social work might go for a time to the homes of the discharged women, for a couple of hours daily, to help and teach at the same time. The fathers are a tougher proposition.

CHEMOTHERAPY OF TYPHUS FEVER

IT is only five months since the treatment of typhus was discussed in these columns,[1] but already there is more to report. Members of the American Typhus Commission from Cairo[2] record a therapeutic trial of a hitherto unused chemotherapeutic substance, *para*-aminobenzoic acid (paba). Justification for this trial lay in the fact that large amounts of the substance were found to have a therapeutic effect in experimental murine typhus infection in mice, and a definite inhibitory effect on typhus rickettsiæ was also observed in yolk-sac cultures. Furthermore, sulphonamide drugs were thought to have a deleterious action in experimental typhus and it was therefore reasonable to expect that paba, which counteracts the inhibitory action of sulphonamides on bacteria,[3] would exert an effect opposite to that of the sulphonamides. The American report describes the effect of 2-hourly dosage with paba by mouth on the course of louse-borne typhus in 20 Egyptians between the ages of 18 and 48. The total dose of drug varied from 70 to over 200 grammes in individual cases; all but 2 patients began treatment before the end of the seventh day, and 9 of them were treated before or on the fourth day of disease. No harmful effect of these massive doses of paba was observed, the mortality in the 20 treated patients was 10% and the average duration of fever was 12·5 days. Argument is brought forward that the drug exerted an ameliorating influence on the course of the disease, reduced complications, prevented nitrogen retention, and caused an earlier defervescence. Cessation of therapy was sometimes followed by a reappearance of fever though this was not accompanied by other manifestations of typhus infection. Two patients developed a typhus rash while receiving paba, though treated from the second and third days of disease. The observed therapeutic effects were studied against a control background of 44 other patients of similar age-distribution admitted before the end of the first week of the disease to the Commission's wards in the fever hospital, and treated symptomatically. These patients, who were selected for study from the general hospital population, experienced severe attacks of typhus with an average duration of fever of 18·5 days and had a mortality of 18%. Nine of them, of whom 4 died, were admitted to the hospital in alternate fashion to the patients treated with paba, but the remainder were admitted at various times during the epidemics of typhus in 1943 and 1944. No fewer than 44% of these patients exhibited nitrogen retention.

The evidence presented is of the kind most difficult to assess in the whole complex realm of human therapeutics. The results are undoubtedly encouraging, yet the possibility remains, as in any group of patients artificially selected from a series, that the control and treated groups were not strictly comparable and therefore that chance distribution of mild illnesses may have favoured the drug therapy. It is clear that, at the very early stage of disease when treatment was begun, prognosis was impossible. However, all who consult the original paper will agree that unless the Cairo workers were unlucky enough to have selected for treatment patients in whom the prognosis was actually better than the average, their results should lead to further trials, though probably not to orders for paba by the ton.

The same paper mentions the use of penicillin in 4 cases of typhus, and though no conclusions are drawn as to whether this agent modifies the course of typhus itself, it is considered of value in treating secondary bacterial infections. Penicillin has been shown to be of value in experimental murine typhus in mice, but relatively enormous doses were required to affect the outcome of the infection.[4] The value of non-specific supportive therapeutic measures in human typhus is stressed in a paper by Woodward and Bland[5] which deals largely with the cardiovascular system in typhus. The circulatory failure, which is so prominent a feature of the disease, is thought to be due predominantly to peripheral vascular rather than to myocardial failure. Adequate fluid intake, parenteral fluids by subcutaneous or intravenous routes, and even human plasma are all regarded as essential in the treatment of typhus, and these, unlike specific remedies such as paba, can be applied even after the first week of the disease at a time when many patients first arrive at the hospital. Their relative impotence in the face of grave typhus is, however, clear from the figures for patients treated symptomatically in the Typhus Commission's ward in Cairo.

EFFORT SYNDROME AND GRAVES'S DISEASE

INTEREST in the effort syndrome, or Da Costa's syndrome, has fallen off since 1941, judging by the numbers of papers published on it. We are still in the dark as to its ætiology, however, and Moschcowitz and Bernstein[6] would like to identify it with what they describe as the larval, or constitutional, phase of Graves's disease. Superficially their case is convincing, provided that the biological concept of Graves's disease is valid. They consider that Graves's disease "is not a nosological entity in the sense that it has a well-defined group of signs and symptoms and a constant background in morbid anatomy," but rather a series of diseases ranging from a larval stage to the final classical picture as described in the textbooks. This thesis is not new—it was mooted during the last war—but added knowledge has strengthened the case. Symptoms and signs in effort syndrome are identical in many respects with those of Graves's disease, and differences are only noteworthy in the florid stage. The basal metabolic rate is usually said to be normal in effort syndrome, and this is often accepted as an important point in the differential diagnosis. But in the larval stage of Graves's disease too the BMR is usually normal; and if a patient suspected of having effort syndrome is found to have a raised BMR the diagnosis is usually changed to Graves's disease. Again, enlargement of the thyroid gland is not uncommon in effort syndrome; whereas in the early stages of Graves's disease, and even sometimes in well-developed cases, the gland may not be appreciably enlarged. True, few records exist of florid Graves's disease having developed in patients known to have effort syndrome: in the only follow-up of any size that has been reported, no case of Graves's disease was found in the 665 patients investigated.[7] It might be argued, however, that a man boarded out of the forces loses much of his cause for anxiety and hence is likely to improve; Cohn,[8] inspecting base hospitals a week after the armistice of 1918, found only a few cases of the effort syndrome where previously they had been numerous. Moschcowitz and Bernstein give records of 11 cases in which the transition from effort syndrome to florid Graves's disease seems to be well established. While their case cannot be accepted as proved, its further study may provide a means of reconciling the conflicting views of psychologists and physicians.

1. *Lancet*, 1944, ii, 214.
2. Yeomans, A., Snyder, J. C., Murray, E. S., Zarafonetis, C. J. D., Ecke, R. S. *J. Amer. med. Ass.* 1944, **126**, 349.
3. Woods, D. D. *Brit. J. exp. Path.* 1940, **21**, 74.
4. Moragues, V., Pinkerton, H., Greiff, D. *J. exp. Med.* 1944, **79**, 431.
5. Woodward, T. E., Bland, E. F. *J. Amer. med. Ass.* 1944, **126**, 287.
6. Moschcowitz, E., Bernstein, S. S. *Amer. Heart J.* 1944, **28**, 177.
7. Grant, R. T. *Heart*, 1925, **12**, 121.
8. Cohn, A. E. *Amer. J. med. Sci.* 1919, **163**, 453.

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Special Articles

HOSPITAL FOOD

I. WHAT IS WRONG WITH HOSPITAL DIET?

HOSPITAL diet is poor because menus are monotonous, because food is badly cooked, and sometimes scanty. This is an old story: but how did it ever come to be told? There must be some fundamental reason for the low standard of feeding in many hospitals which in other respects give a high standard of care for patients.

BIRTH OF A BAD HABIT

The history of provision of care for the sick gives some clue to the anomaly, for the feeding of patients is closely allied to the history of nursing. Nursing developed under the auspices of the Church, and its guiding principle was charity; it embraced the care of both the sick and the poor, and included the distribution of food and alms. At the Reformation religious institutions were destroyed, and the hospitals with them; and for some time there was no care for the sick. When hospitals opened again they were no longer under the auspices of the Church, and then it was that nursing sank to its lowest level, and nurses were drawn from the poorest class of women. The standard of living of the poor was so low that no-one troubled much about their feeding in hospital: it was left to the poor and sometimes degraded women who nursed them. Yet a few hospital authorities gave a little thought to it.

> At St. Bartholomew's, for example, in 1687 a new diet was agreed upon, and in 1715 the diet was improved. Little importance was attached to food as a means of restoring health, however, for a ruling in 1744 decrees "that patients are to lose their dinner on any Sunday or holiday that they do not go to Church." That the medical profession had some jurisdiction is evident from the statement, in 1755, that "the physicians may order pudding instead of meat."

The reforms begun by Florence Nightingale towards the end of the nineteenth century, and still continuing today, brought improvement in the service of meals to the patients; but nutritional values were still not studied very seriously. Moreover, though it became the duty of the matron to supervise the diet, the purchase of food was never entrusted to her, and she had no power to decide what salaries should be paid to the kitchen staff or to choose equipment for the kitchen. Her task was, and is, to distribute to the patients the food bought by the hospital, and cooked by the hospital cooks.

THE PATIENT'S GRIEVANCE

The basis for the diet in many hospitals before the war was one main meal a day: for the rest of the day patients had to depend on food brought in by relatives and friends. The list of things which patients were asked to bring with them into hospital included such items as butter, eggs, sugar, and in some instances tea. This practice goes back to the time when hospitals were purely charitable, and the diet offered was merely at subsistence level. But nowadays most patients pay, and pay well, for hospital care, and they have a right to expect to be fed well in return. Rationing has provided sound reasons for altering the old practice. The patient hands over his or her ration books to the hospitals and may justly expect to receive as much as anyone else in the country—unless, of course, he needs a restricted diet. Yet we repeatedly hear of hospitals where patients get only part of their ration allowances for the week.

Indeed the defects of the present diet, from the patient's point of view, are multiple. Not only is the food often poorly cooked, and generally rather cold, but there is little weekly variety and seldom any choice of dishes. If only one cooked meal a day is served (which is quite often the case), supplemented by an uncooked breakfast and tea, the actual quantity of food offered may be insufficient to satisfy appetite. Finally nearly every meal is taken in a hurry. No sooner have the nurses brought the plates round than they are fretting to clear them away again, and get on with the next job—a round of bedpans. The situation is an awkward one: clearly it is not a good plan to be taking round bedpans while people are eating, so the two events cannot be allowed to overlap. The other cause of a rush at mealtimes is, of course, shortage of staff.

THE DOCTOR'S GRIEVANCE

The doctor might criticise the diet on all these grounds and on others besides. He will feel strongly that a hungry patient should almost always be fed according to appetite; and he should be even more critical when a patient with a poor appetite is offered insipid or even repellent food. "Light diet" in hospital is apt to be monotonous in type and meagre in quantity, especially in war-time. We have only to think of the food a good wife or mother will provide in the home for the sick husband or child who "fancies something light," to realise that a piece of steamed fish and some rice pudding, bleakly served on chilly plates, are not what the doctor ordered. Again, in hospitals where there is no dietitian, patients on special diets often complain that they are given foods which are obviously wrong or offered in the wrong quantities. The patient on a roughage-free diet, for example, may be brought a plate heaped with cabbage, and if he has a simple and trusting character he may eat it. If he protests he may acquire a reputation for faddiness, always punished severely by busy nurses. We have heard of a man who two days after a partial gastrectomy was offered a square meal of meat, potatoes, and green vegetables. Fortunately, he knew better than to eat it; but such a wrong beginning might have spoiled his chances of ever learning to digest again with his diminished gastric mucosa. In such cases, as in lawn-tennis, a good beginning is half the battle. There are many reports, too, of diabetics given the wrong food, of children with cœliac disease given the wrong quantities, and of patients of all kinds going hungry because they could not fancy their food.

If, as sometimes happens, a patient receives his food from the hands of a different nurse every day—almost every meal, it may seem to him—he cannot hope to impress each one with a sympathetic regard for his likes and dislikes. Nor are the nurses in a position to help him much. They can only serve him with what comes up from the kitchen, and at the speed which routine demands. The student nurse, during her preliminary training, learns invalid cookery and is taught how to make a tray attractive with clean linen and a nosegay. She rarely uses that technique again, unless she takes up private nursing. In the wards she is told "we haven't time for all that kind of thing." Even if she had the time, she would usually find that the ward had not enough trays to go round, let alone linen and nosegays. But it is worth noting that a few hospitals do achieve the standard which the sister-tutor teaches to student nurses; and this seems to indicate that it should not be beyond the power of every hospital in the country to do the same.

WHO BEARS THE BLAME?

Where does the responsibility lie for all these drawbacks? Unfortunately it is scattered among several parties. For a sparse and monotonous diet, the committee first, abetted—often unwillingly—by the steward and matron, must usually take the blame. There are still some institutions where the menu is drawn up by a house-committee, governed in their choice of food more by financial than by nutritional requirements; but in most institutions it is the responsibility of the matron and may be planned by her or by the housekeeping sister—and neither of them may be adept at planning a diet with sufficient variety, or at inspiring cooks to a pleasing diversity of treatment. The steward is prone to economise on the quantities purchased, and often fails to take advantage of the day-to-day opportunities of the market. There are excuses for all: the steward's committee may be urging him to cut down expenses; the matron and her assistants, suffering under the same parsimony, may be handicapped by having an inadequate and poorly paid kitchen staff. Both forms of economy are thoroughly bad.

It is apparently the exception rather than the rule for hospital cooks to taste the food before it leaves the kitchen; yet no cook worth her cooking-salt would leave a dish untasted in her own home. But apart from staffing defects, kitchen equipment is often out-of-date,

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inadequate, or otherwise defective. We have heard of one large EMS hospital where the daily kitchen staff habitually take in their own vegetable knives because there are not enough to go round. Again, methods of serving may be poor. Meat may be sliced an hour or more before it is needed and then be left on a hot-plate, getting drier and tougher, till the time comes to take it to the wards. Or carving may be done unskilfully by nurses, kitchen-maids, or porters, so that ragged fragments appear on the plates, and much food is wasted. Green vegetables may be cooked too long, with the result that their vitamin content is destroyed; and they are often inadequately drained. Potatoes may be carelessly peeled, blackened spots and "eyes" appearing in them. Rice-pudding, monotonous at any time, may be watery, flavourless, and short of sugar. Too little ingenuity and time may be spent in making a cold tea- or supper-dish look attractive. A slab of corned beef and two lettuce leaves is not a salad dish for a sick person. Sad suet pudding would tax the digestion of a schoolboy. Strong tea may be agreeable to old people but is disgusting to children.

Food may be cold when it reaches patients because it is transported along draughty corridors on old-fashioned open trolleys, instead of in the heated trolleys which were available long before the war. The trolleys, moreover, may be loaded up by porters who are cheerful and willing enough, but who have very casual ideas on cleanliness and hygiene. A container without a lid—holding potatoes say—may be covered by another container taken up off the floor. Minor delays en route may be overlooked as trivial, the trolley being left standing in a chilly corridor while the porter waits for a free lift or unloads the trolley at a ward. These things happen even in well-disciplined hospitals: porters cannot spend their lives weighing advantages and disadvantages to patients; that is not their job, but the job of doctors, nurses, and the hospital committee.

Some of these defects can be corrected by a clever and imaginative ward sister. She can serve the helpings neatly and elegantly; she can slice that corned beef finely and arrange it in a pattern; she can chop up the lettuce, decorate it with some slices of tomato, serve the salad cream in a small clean jug. Granted she can do all this if she has time, if she has imagination, and if she is that increasingly rare bird, a born nurse. Sometimes she is not, and more often she is tired, harassed, and short of adequate help. To a woman in that state even the most reasonable request of a patient becomes a piece of presumption. We have heard of a patient who asked that her lunch-time rice pudding might be put by and given her at tea-time. "Certainly not" was the reply to that; "she won't want it then." Which of us, if sick in our own homes, would be denied such a moderate indulgence? But, again, the most patient person cannot work miracles. If the food which comes up from the kitchen is chilly, monotonous, and badly cooked, the best service in the world could not make it appetising. If there is no choice, the ward sister cannot tempt a capricious appetite.

A SUMMING-UP

In the main the hospitals may be blamed for two cardinal faults in their approach to the subject of diet: they have failed to appreciate the importance of correct feeding, and most of them have failed to place the responsibility for catering in the hands of a single experienced officer with sufficient influence to stake out a fair claim on the hospital income. But we, as doctors, are primarily to blame for not insisting that the needs of our patients are properly met.

The prescribing of diets is a part of treatment, and should remain so. The interpretation of the prescription must continue to be the responsibility of the ward sister, who knows the likes and dislikes of the individual patients. But while the buying of food is the responsibility of one officer, and the cooking the responsibility of another, and the distribution perhaps of a third, it is not possible to achieve a high uniform standard throughout hospital feeding. The result of this lack of unified control displays itself in many hospitals in:

1. Failure to provide adequate meals throughout the day.

2. Inexpert buying, and failure to use food obtainable in the open market.

3. Lack of sufficient skilled kitchen staff, resulting in poor variety, careless seasoning and garnishing of dishes, absence of sauces, and the spoiling of good food in the cooking.

4. Out-of-date equipment for cooking and service, and lack of labour-saving devices.

MEDICINE AND THE LAW

Dispensary not a "Hospital"

Mr. Alfred Ford of Solihull, dying in 1941, left property worth £174,000, and directed by his will that his residuary estate be held in trust for division equally among the voluntary hospitals of Birmingham and Solihull, and two other named institutions. In preliminary proceedings in the Chancery Division the court ordered an inquiry to identify the voluntary hospitals in the two areas specified. The result was a list of 16 hospitals. The Birmingham General Dispensary, not included in the list, petitioned to be inserted as a 17th participant. Mr. Justice Vaisey, giving judgment on the application on Dec. 19, reluctantly ruled against it. He paid full tribute to the applicant institution, its merits, and its admirable administration. It had been founded by voluntary contributions in 1793 and was not conducted for profit. It had 11 branches, including dental and massage departments, and casualty clinics. During 1943 it treated no fewer than 29,916 patients. It had a full-time medical, dental, and pharmaceutical staff, with consultants in almost every branch of surgery and medicine. But was it a "hospital"? The judge regretfully felt that the ordinary meaning of the word compelled him to answer "No." In the English language "hospital" signified a building where inpatients were received, not a casual dispensary. The casualty clinics were set up to treat minor industrial injuries and ailments hitherto treated only at hospitals. He thought that if anyone were asked to give a list of the hospitals in Birmingham, it would not occur to them to include these 11 separate branches; the totality of them did not justify their being called a "hospital."

The 16 successful claimants had no wish to exclude the Birmingham General Dispensary, but had no authority to relinquish any part of their shares to an institution not entitled to participate in Mr. Ford's bequest. Perhaps some future testator will correspondingly recognise the claims of the dispensary.

Bogus Practitioners

The offence of masquerading as a qualified medical practitioner naturally varies in its punishment according to the circumstances of the case. Thus David Meirion Gray Davies, aged 30, pleading guilty to two offences before the Llanelly magistrates, was fined a total of £50 with £5 11*s*. 6*d*. costs. On the strength of his assertion that he was a "triple conjoint," he was engaged as locum tenens by a doctor who was going on holiday. The suspicions of the secretary to the insurance committee at Carmarthen were aroused and Davies was questioned about his qualifications. He replied that he was a registered practitioner. Later he admitted that this was false. He had attended a patient suffering from tuberculosis. She died, and he made out a medical certificate in which he attached to his signature the qualifications MRCS, LRCP. The two offences consisted of falsely pretending to hold these qualifications and making a false certificate for the purpose of death registration. When interviewed by the police, the accused stated that he had been a medical student at Charing Cross Hospital from 1934 to 1938 when he took the premedical examination of the Conjoint Board and also the examinations in anatomy and physiology. From there he went up, he said, to the Royal Colleges at Edinburgh, intending to complete his finals. The rest of his story showed a curious domestic dilemma. The war intervened. His mother fell ill and he could not leave her; if he had qualified, he would have been called up; he therefore decided not to take his finals. On the other hand he had to pretend to his parents, "as their financial position was by this time not too good," that he had successfully qualified. The Llanelly

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doctor, he said, came to his house to ask him to act as locum tenens; his father, believing him to be qualified, persuaded him to take the appointment. The case illustrates afresh the ease with which unregistered persons can assert that they are registered, and the need of vigilance in checking an applicant's qualifications.

Another recent instance from Scotland, where the defence aroused less sympathy, ended in imprisonment. Robert Hamilton Deans, aged 36, passing as a doctor "attached to the Canadian secret service," was sent to prison for 12 months on eleven admitted charges. The offences included posing as a registered practitioner, fraud, and bigamy. Deans was stated to have charged big fees for treating patients for neuritis. Fees of £100, £30, and 10 guineas were mentioned; it was said that he had obtained at least £200 by his frauds.

SURGICAL BELTS

THE Board of Trade is still receiving a large number of wrongly worded certificates supporting claims for surgical belts and corsets. Manufacturers can now supply these against a single medical certificate giving the date, the patient's name and address, the condition from which he is suffering, and the doctor's name and address. Where necessary a description of the garment required should be enclosed. The following list of approved conditions covers most of the cases which require a surgical belt or corset.

Abdominal diseases	
Severe enteroptosis	Ventral hernia
Severe gastroptosis	Severe visceroptosis
Diseases and injuries of the spine	
Actinomycosis	Osteochondritis juvenilis dorsi
Arthritis deformans	Osteomalacia
Carcinoma	Osteomyelitis
Dislocation	Sacro-iliac disease
Fibrocystic disease	Spondylitis
Fracture	Tuberculosis
Fracture-dislocation	
Deformities	
Kyphosis	Scoliosis
Lordosis	Spondylolisthesis
Diseases of the nervous system	
Cerebral diplegia	Paralysis of abdominal muscles
Muscular atrophy	Paralysis of spinal muscles
Muscular dystrophy	Spinal neurosis
Diseases of the breast	
Acute mastitis	Chronic mastitis
Conditions requiring a belt with pad, cup, chute, disc, plate or metal frame, after operation for:	
Appendicostomy	Gastrostomy
Cæcostomy	Ileostomy
Cholecystostomy	Jejunostomy
Colostomy	Nephrostomy
Cystostomy	Ureterostomy

If a surgical corset is needed by a patient suffering from some other disability, a fuller medical certificate should be sent to the Board of Trade giving sufficient detail to make clear to the medical advisers of the Ministry of Health or the Department of Health for Scotland (one of these departments will be consulted in all such cases) the precise nature of the disability. If the doctor does not wish to disclose the patient's condition, the certificate should be sent to the Ministry of Health,[1] or in Scottish cases, to the Department of Health for Scotland,[2] with a separate signed document containing the patient's name and address, and a description of the type of garment required, for the guidance of the manufacturer. The certificate will be treated by the Ministry or Department of Health as confidential. On the recommendation of their medical advisers the Board of Trade will endorse the second document and return it to the patient, who will use it to obtain a surgical corset in the normal way.

1. Supplies Division, Whitehall, London, SW1.
2. Supplies Branch, 23, Eglinton Crescent, Edinburgh, 12.

Reconstruction

LOCAL GOVERNMENT

FOLLOWING discussions with local-government associations, the Government have issued their proposals for the post-war period in a white-paper, *Local Government in England and Wales during the Period of Reconstruction* (Cmd 6579, HMSO, pp. 20, 4*d*.). This begins with a tribute to the flexibility and adaptability which local authorities have shown in the war years, refers to the importance of capacity and public spirit in officers and members, and declares the object of its proposals to be the strengthening of the framework of local government to bear greater burdens and fulfil new tasks.

At present county boroughs are completely self-governing communities, whereas in counties there is a two-tier system; county councils, in addition to performing certain functions themselves, also having supervisory and coördinating powers over duties carried out by the county districts. This fact, together with the absence of desire in local-government circles for any recasting of the present structure, and the time needed for such a recasting, has clearly influenced the form of the Government's proposals. The alternatives are briefly examined before they are wholly or partly rejected. They consist in nationalisation, regionalisation, and the creation of joint authorities for planning or executive purposes.

POSSIBLE ALTERNATIVE SYSTEMS

The white-paper notes the wide fears of a growing tendency to transfer local-government functions to the State. In fact, the only permanent transfers in the past decade concern maintenance of the able-bodied unemployed, the supplementation of old age and widows' pensions, the national veterinary service, the national agricultural advisory service, and functions relating to milk production on farms. Under contemplation for national administration are extensions of the trunk road system, some residual public-assistance functions, the fire service, and some public-utility services now fortuitously private or public as regards administration. While not prepared to rule out the possibility of transferring other functions to State control if the case is sufficiently strong, the Government are in general opposed to the policy of transferring services essentially local.

Nor do they favour the creation of regional authorities, directly elected to administer services over wide areas. Apart from the unanimous opposition of the local-authority associations to such a step, it would involve a two-tier system in county boroughs and possibly a three-tier system in counties. The regional commissioner system is also to go, with the consequent removal of some popular misapprehensions. It was never designed to alter the local-government system but to meet conditions which might interrupt communications between the seat of the government and the rest of the country.

There remain, however, various services (of which hospitals are a notable example) where coördination between two or more areas is essential. For these the Government favour an extension of the established procedure of joint boards or joint committees. These are not directly elected; their financing by precept may discourage a due regard for ways and means; it is not satisfactory to divorce planning from execution; and as the field for their work is more widely recognised they may multiply excessively. Nevertheless, the difficulties are not so great as to delay the working out of the reconstruction programme, nor is ultimate integration of joint bodies in any area ruled out.

LOCAL GOVERNMENT FINANCE

Education, housing, health services, and the reconstruction of war-damaged cities and towns will, in the future, all require increased expenditure at enhanced cost in the form of higher wages, salaries, and prices. Most of this increase will be borne by the taxpayer, who has the benefit of the higher wages and salaries, but some will inevitably fall on the rates. The total rate increase is incalculable at present, but it will be of the order of £10 millions for education and £7·5 millions for health services. Local financial burdens are mitigated by the central government in the following three ways.

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I. Direct grants, normally a percentage (usually 50) of the total cost or unit grants, as in the case of the housing subsidy. The education grant will rise from a pre-war £45·5 millions to £71 millions post-war; the health service grant from £0·5 million to £44 millions. The total cost of these services is estimated to increase, in the case of education, from a pre-war sum of £93·8 millions to an immediate post-war £129 millions, and, in the case of health, from £41 millions to £92 millions.

II. The General Exchequer (Block) Grant, amounting at present to £46 millions, reviewed every five years, and distributed according to a statutory formula giving proportionately greater benefit to the more needy areas. The white-paper gives the graphic illustration that this is as if the Exchequer were a ratepayer paying rates on an assessment equivalent to 22½% of the whole rateable value of the country.

III. The acceptance by the Government of liability for services previously borne by the local rates, as in the case of the able-bodied unemployed.

With all these aids, certain areas, judged by any available test, will remain "poor" areas for which additional assistance will be a matter of special consideration.

BOUNDARY ADJUSTMENT PROCEDURE

The framework of modern local government was laid down in 1888, when the Local Government Act of that year established 62 counties and 61 county boroughs. It is interesting to note that only 10 county boroughs were originally designed and that there are now 83. The need for adjustment of areas arises constantly and until 1926 county-borough boundaries could be extended by an Order of the Minister of Health, subject to confirmation by Parliament. The constant whittling away of county territory was the principal cause of the setting up of the 1922 Royal Commission on Local Government, on whose recommendation the earlier procedure was abolished. County-borough extension could henceforth only be effected by private Act and the creation of a new county borough by the same procedure and a population of at least 75,000; in fact, only one new one has been created. The machinery for county-district review was established by the 1929 Local Government Act. The review of its own area was made by each county council, its decisions being confirmed, with or without modification, by the Minister of Health. The first review was completed by 1937, the total number of urban districts being reduced by about 300 and the rural districts by a similar number. Boundary alterations are at present barred, but further county reviews and many county-borough applications may be anticipated in the near future. The examination of all proposals for adjustments—whether of counties, county districts, or county boroughs—by a single body is thus a matter of urgency.

ESTABLISHMENT OF LOCAL GOVERNMENT BOUNDARY COMMISSION

It can be best achieved by the setting up of a boundary commission of not more than five members and an appropriate staff, with the duty to review county districts and to examine applications for county-borough creation and extension. The reduction of status of small county boroughs, the union of contiguous county boroughs and of some of the smaller administrative counties will also, subject to safeguards, be within the scope of the commission.

Safeguards would include (*a*) the issue of general directions to the commission by the Minister and (*b*) the submission of the more important decisions of the commission to the Minister in the form of draft orders, for Parliamentary review. The general directions would be formal documents, approved by Parliament, covering such matters as the minimum size of areas, from the point of view of population and rateable value, which could function as local-government units, and the linking of town and surrounding countryside in appropriate units. Points affecting the creation and extension of county boroughs, although no general formula is practicable, might also be included in the general directions, as might be indications for combinations of areas for specific purposes, such as housing and water-supply. There would also be, in the interests of long-term planning, a prohibition of further applications from any area during a ten-year period. Orders affecting the status or boundaries of county boroughs and counties will require Parliamentary confirmation. They will be transmitted to the Minister of Health as draft orders, with a short statement of the local inquiry proceedings, a summary of the evidence, and the considerations leading to the commissioners' decision. The procedure to be followed by Parliament is not yet settled, but in any case it will not duplicate the local inquiry by considering detailed evidence.

The commission will work by undertaking a preliminary review of each *geographical* county including county boroughs. If there is prima-facie evidence of the need for a local inquiry, or should a request to that effect be preferred by the Minister, the county, or any county-borough council in the area, such a local inquiry must be held. The Minister may direct the order of the reviews, so that, for instance, preference could be given to war-damaged areas, and the commission must submit to the Minister an annual report of their work, for presentation to Parliament.

TWO SPECIAL PROBLEMS

The first problem awaiting solution is that of the County of Middlesex, which contains a population of two millions in 15 non-county boroughs and 11 urban districts. No fewer than 10 of these already have populations larger than the minimum for county-borough status. By unions of contiguous boroughs it would be possible to convert the whole county area into county boroughs, thus destroying the county government. The commissioners are, therefore, not to be given power to entertain applications for county-borough status from authorities in this county.

The second problem is that of local government in London. It embraces two broad issues: whether the boundaries of the county should be extended and whether, within the county, the number and the areas of the 29 boroughs and the allocation of functions between the borough councils and the county council are satisfactory. The London Civil Defence Region, with double the county population, and the areas for police, water, and traffic have proved satisfactory units, though, on the other hand, the population of the present county area is nearly double that of any other local-government area. The white-paper, on the score of interference with the reconstruction programme, fights shy of this issue, but promises, as a matter of urgency, an authoritative body to inquire into and advise the Government on the local-government problems within the county.

NEW YEAR HONOURS

IN the list of promotions and appointments in the Order of the British Empire published on Jan. 3 the names of the following members of the medical profession appear:

OBE (Civil)

JOHN BEATTIE DUNLOP, MB CAMB.
Post Office MO, Bradford, Yorks.

VICTOR LAURENCE FISHER, MRCS
Senior surgeon, ss. *Stratheden*, P. & O Steam Navigation Co.

DONALD MCFARLANE LIVINGSTONE, MD GLASG.
Senior MO, Surrey county council, for services to civil defence.

HAROLD ETTRICK MOORE, MB MANC.
Civilian adviser in rehabilitation to the Air Ministry.

Colonel MATTHEW BURROW RAY, DSO, MD EDIN.
Medical assessor to the joint war organisation of the British Red Cross Society and Order of St. John.

CAMPBELL KAY STEVENSON, MD GLASG.
Supt. of the Emergency Hospital, Kilearn, Stirlingshire.

CHARLES LINDSAY SUTHERLAND, MD GLASG., DPH
Chief MO, silicosis medical board.

ALEXANDER BOYD WILLIAMSON, MD EDIN.
MOH for Portsmouth, for services to civil defence.

The names of the following Canadian officers were included in a list issued on Jan. 1.

CBE (Military)

Brigadier JONATHAN CAMPBELL MEAKINS, MD MCGILL, FRCP, Canadian Army.

OBE (Military)

Surg. Captain DONALD ROBERTSON WEBSTER, MD DALHOUSIE, RCNVR
Colonel JOSEPH ARTHUR MACFARLANE, MD TORONTO, RCAMC
Colonel LORNE CUTHBERT MONTGOMERY, MC, MD MCGILL, RCAMC
Colonel FRANK PERCIVAL LLOYD, MD TORONTO, RCAMC
Lieut-Colonel EDMUND HENRY BOTTERELL, MD MANITOBA, RCAMC

MBE (Military)

Major CHARLES HOLLENBERG, MD MANITOBA, RCAMC

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Letters to the Editor

PSYCHIATRIC CASUALTIES IN MALTA

SIR,—In your issue of Sept. 30, 1944, Colonel Elliott C. Cutler says :—

> "... there are statistical data to support the fact that where there is no escape route, these psychological casualties do not arise, or arise but rarely. Thus they are not reported for crews of submarines, and surely this might be thought of as a place for psychological strain, and few on the island of Malta were afflicted once escape was found impossible."

This latter statement is not new. In fact from the days when the siege of Malta lifted and medical officers could go home to recount their experiences of the medical services on George Cross Island one has continually heard the cry : "There were no psychiatric casualties on Malta because there were no psychiatrists." Admittedly Colonel Cutler credits the island with a "few," and it is true that during the siege of Malta there was no Service psychiatrist on the island. But it is not true that there were no or few psychiatric casualties : there were many. I was on Malta from February, 1942, until March, 1944, employed in the first instance in a British military hospital on the medical side, and latterly as an administrative officer, and I would like to correct those who have accepted this statement as fact, because it has since been used as a battle-cry against psychiatrists.

In Malta, psychiatric cases were centralised in a British military hospital which stood on a hill overlooking an aerodrome. This aerodrome was the object of numerous enemy attacks and could well be described as being within the target area. The psychiatric patients were in an unenviable position in the huts and stone buildings nearest to this aerodrome, and the sounding of an alert, the first crack of the ack-ack, or the noise of approaching planes, resulted in a stampede of those unfortunates to the deep shelters which were some distance away. These shelters housed them at night, and often nearly all day as well.

I can quote no figures, no numbers, and it may be said that official records of patients in Malta do not support the above assertions ; but it should be remembered that when it did become possible to evacuate casualties from Malta, air service was used in the first instance. Psychiatric casualties are not popular passengers for air evacuation, and in order to get them away to psychiatric centres it was sometimes necessary to modify the diagnosis. Thus "dyspepsia, functional" would become "gastritis, chronic."

There may, however, be other medical officers who served in Malta during this period who have their own records of such cases and their numbers, and these, I hope, will support my claim. My wish is only to correct some of the mis-statements now being made about Malta, the true story of which still remains to be written.

BLA. ROBIN LEES.

INJURY TO THE BILE-DUCT

SIR,—Professor Grey Turner's article on the dire consequences of operative damage to the common bile-duct (*Lancet*, 1944, i, 621) was a warning against complacency in cholecystectomy. The accident is perhaps less likely where the operation is difficult because of dense adhesions or inflammatory reaction which has not subsided—where the necessity for great care is obvious—than in the ordinary case where the operation looks easy but some abnormality of the bile-ducts is present.

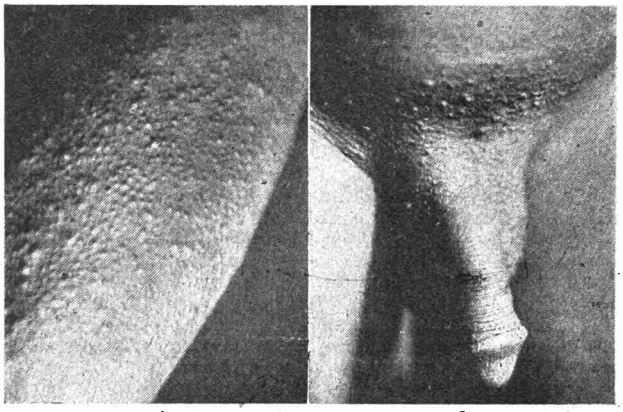
In the latter type of case I have used for a good many years the following manœuvre which facilitates dissection and is a reminder that clear visualisation of the structures is important. The parts having been exposed under a general anæsthetic, procaine solution is first injected round the peritoneal reflection of the gall-bladder, and between it and the liver, and is then used to balloon up the areolar tissue round the cystic duct. This procedure serves as a kind of preliminary dissection, so that the cystic artery, for example, may show itself as an isolated strand and exposure of the ducts is simplified.

The method was adopted, however, for other reasons. It is well known that gall-bladder operations are apt to be followed by pulmonary complications at the base of the right lung, presumably due to a reflex spasm of the right diaphragm ; and this in turn has been ascribed to the pain in the laparotomy wound ; long-acting local anæsthetics, such as quinine-urea hydrochloride, have been used in the abdominal wall to obviate the danger. This view, however, ignores the fact that the posterior peritoneum is sensitive. Procaine, used as described above, cuts off noxious stimuli at the time of operation and may make the nerve-endings less irritable afterwards. Whether or not this is so, the convalescence of these cases appears to me to have been favourably influenced since procaine has been used in this manner.

Birmingham. J. W. RIDDOCH.

KERATOSIS FOLLICULARIS IN AFRICANS

SIR,—While in Syria in medical charge of some 400 native troops from East Africa, I noted that about half of them exhibited a skin condition resembling that known as keratosis follicularis or phrynoderma, occurring among native races in many parts of the world, particularly in East Africa and China. The men were found to have a generalised dryness of the skin associated with the characteristic follicular eruption distributed on



1 2

Follicular eruption on extensor surface of forearm (fig. 1) and pubic region (fig 2).

the extensor surfaces of the limbs, on the buttocks, neck, the hairy portions of the face, and the pubic region (figs. 1 and 2). There was also hyperkeratosis of the soles of the feet.

In view of what has been published it seems probable that the affection was a result of vitamin-A deficiency. This view was confirmed by finding that the diet of these men for at least 15 months could have contained only traces of vitamin and provitamin A. The diet was also relatively deficient in vitamin-B complex.

Circumstances did not permit of further investigations or the institution of therapeutic measures.

CMF. P. ROBINSON.

REPAIR OF TRANSVERSALIS FASCIA IN INGUINAL HERNIA

SIR,—A few days ago I was privileged to discuss the surgery of inguinal hernia with Prof. Raphaele Bastianelli, one of the first foreign honorary fellows of the Royal College of Surgeons, and until recently professor of clinical surgery in the University of Rome. Needless to say, he did not share the critical views I expressed regarding the operation of his famous predecessor Bassini, for which he has a profound respect, although it has never been possible for him to follow up his cases in detail. Professor Bastianelli agreed, however, that the Bassini operation was unnecessarily complicated and disturbing in early cases where the sac was small. When I talked of the importance of the repair of the transversalis fascia, he took from a shelf in his well-stocked library the reprint of an article published by him in the *Zeitschrift für ärztliche Fortbildung* (1913, **19**). Here on p. 14 is an illustration of his method of repair of the fascia, which he regards as a very important step. After removal of the sac the edges of the fascia are caught in forceps and the defect is closed by a purse-string. The suture begins by traversing the

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internal oblique above and external to the internal ring, encircles the fascia, and emerges through the internal oblique in the reverse direction at a point near its entrance, and is tied there. This method, published 32 years ago, seems to be superior to the one I suggested in the *British Journal of Surgery* of October, 1943.

Dec. 31, 1944. HAROLD C. EDWARDS.

HOSPITAL FOOD

SIR,—This company has for three or four years undertaken the entire catering at the Royal Hampshire Hospital, Winchester, under contract. This was entered into at the request of the hospital authorities, and we are pleased to state that complete satisfaction has been obtained throughout the period.

By employing a qualified firm with catering knowledge and an organisation to deal with the many difficulties inseparable from food matters, the staff and patients are enjoying well-balanced meals and a variety of dishes hitherto unknown. The cost to the hospital is certainly not greater than that under the former method—in all probability rather less—with greater satisfaction all round.

J. OSWALD ROOKE,
Managing Director.

The Mecca Cafés.

IMPREGNATION VERSUS INSECTS

SIR,—In your annotation of Nov. 18, 1944 (p. 663), you describe some of the achievements with new insecticides during the present war, especially with DDT. I believe it is too early yet to state categorically whether DDT is as effective in destroying adult mosquitoes in houses as it is against lice in clothing. If eventually DDT or any other preparation be found which is 100% effective, it will obviously be of the greatest service to man.

Over 30 years ago General Gorgas advocated the destruction of mosquitoes in houses in the Panama Canal Zone as a very important measure in the fight against yellow fever. Samuel Darling agreed, but pointed out that to be effective the spraying must destroy *all* the mosquitoes in the treated room, not merely disperse them. The spraying of rooms with a repellent or an only partially effective insecticide may do more harm than good. Repeated reinfections do not influence the severity of the disease. Therefore it is better to leave the mosquito to feed in the room where the occupants have probably contracted the disease rather than drive it into rooms of non-infected people. In countries where malaria is sporadic, and even in poverty-stricken regions where malaria is endemic, the regular use of a cheap and really satisfactory insecticide would do much to reduce the incidence of the disease.

Several house-haunting species of *Anopheles* survive for many months, spending the greater part of their lives inside houses. The *atroparvus*, *labranchiæ*, *elutus*, all three members of the *maculipennis* group, become sexually liberated, towards the end of the summer but continue to feed greedily every 48 hours for many weeks well into the late autumn. In autumn, moreover, the natural death-rate of these insects is much lower than during the active breeding season, when they are less protected from their natural enemies and many are drowned in the process of egg-laying. Some of my recent experiments produce the following results: (1) The salivary glands of a heavily infected *Anopheles maculipennis* may contain over 135,000 sporozoites; (2) after twenty separate blood meals over a period of forty days the salivary glands may still contain over 20,000 sporozoites. In nature, such heavily infected insects may, providing they feed only on man, cause at least twenty cases of malaria. The killing of one such insect would be far more important than destroying large numbers of larvæ, which as adults may never become infected or even feed on man.

In post-war eastern Europe a cheap insecticide, safe, easy of application, really effective against mosquitoes in houses, would be of the utmost value.

P. G. SHUTE.
Ministry of Health Malaria Laboratory, Epsom.

ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS.—A meeting will be held in Birmingham on Thursday and Friday, Jan. 25 and 26. Visits will be paid to iron foundries, and at 2.30 PM on the 26th, at the Birmingham Accident Hospital, Dr. G. F. Keatinge will speak on health in iron foundries.

In England Now

A Running Commentary by Peripatetic Correspondents

THE troubles in liberated countries, said the Archpsych, are due to the fact that a man who has been C-in-C of a group, tossing for the torture chamber twice a week, is not going to be bossed even by a well-elected gent who's been playing dominoes in London. There has been a very strenuous election in these countries, but it's been by ordeal and cunning, not the ballot-box. Food and security are not enough for these men now: they must have self-expression and its comparative and superlative, self-importance and power, as well. That's fundamental to man everywhere. Listen to the wireless and note how every artist gets his spot of preen after every performance; live in a village where you can watch a unit of human society in action—Church, WI, Legion, Chapel, Scouts, Guides, all with their heirarchies, sorting themselves out in order of powerfulness; the Table of Precedence itself is simply an attempt to stabilise the "peck order" round the throne. If we want to avoid trouble in this country we must realise that there has been an election going on for five years, an election by merit and character, and that every possible position from seats on parish councils to seats in Parliament should be made available to those who have been successful in it.

Politically democracy is an equality of opportunity, but biologically it should be an equality of function too. Probably the best thing we could do when we suck the half-time lemons after the defeat of Germany would be to have a great turn over and as far as is practically possible make the civilians soldiers and soldiers civilians, from PM Montgomery and FM Churchill downwards. (Voice: What about you?) "I," said the Archpsych with dignity, "although I have an overweening conviction that no-one has quite my penetrating understanding of the inner workings of humanity. I shall follow my own dictum and shall apply for a job as dermatologist in the army against Japan" (cheers).

* * *

"Paint me as I am," shouted Oliver Cromwell to the young artist, "warts and all." It is the fault of George Borodin, the author of *Red Surgeon* (London: Museum Press. Pp. 274. 15*s*.) that he fashions the too perfect hero—no warts, no scars, no wrinkles—and thus makes him unreal. The story begins with the simple Wordsworth thought, "the child is father of the man." The Red Surgeon is pictured first as the little boy handling a beetle with infinite gentleness to avoid hurting it; at the sight of a rabbit in pain his eyes blaze, his face whitens, and his temple pulses visibly race. The boy fights to rescue the animal from some other youths, and then tends to the animal indifferent to his own blood falling drop by drop "like a miniature rain-shower." Most unreal; I am sure most surgeons, even the very distinguished, delighted in tying the tin can to the cat's tail and watching its antics, poked and annoyed the little dog, bird's-nested, and even trapped if they got a chance, like the rest of us. There was no real thought of hurt in their hearts, it was just like the game of teasing and catching out their own fellows. Most laymen picture the surgeon with long strong graceful fingers, and the Red Surgeon is thus equipped. Actually, the surgeon's hands differ but little from other hands; they may be short and stubby or long and tapering. Like the heroes in this war, as we have learnt, there is no pattern. I have seen small heroes, tall ones, fat ones, and even bald ones. To garb the Red Surgeon even more adequately he is born of a father who dies early for the Revolutionary cause. It must be very rare for the Revolutionary to beget a leading Revolutionary son. Who knows aught about Lenin's father, Stalin's, Karl Marx's, or even Hitler's (except his name)? One little wrinkle above all I missed in this Red Surgeon's make-up. Not until well over forty does his heart do cartwheels for any woman. I just don't believe that about surgeons. At any rate in this country, hospital matrons have a surprising appreciation of the surgeon's temperament, for almost invariably it is a pretty girl and one sharp of tongue that swirls her gown in the surgeon's court. The Red Surgeon in the midst of battle falls in love with a beautiful lady physician; and here the author gives away the purpose of the book when he says "she symbolised Russia." Working during the day, sniping at

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night, she hated with the fury of a woman the German invader. The story ends with the young lady physician fighting furiously in battle, "handing death to the invader"; then a sniper's bullet ends her life, the Red Surgeon is blinded and loses both arms.

This book is an excuse for propaganda about Russia. But Russia needs no propaganda. Her living deeds speak for themselves, and to build the story of her heroism and sacrifices around a rather unreal hero does scant justice to her. To illustrate the book there are some propaganda pictures; frozen corpses, skeletons, and battered little children. Other horrors by the Nazis, some of which are beyond belief, are described; the carving of the swastika on an old woman's breast, the burying of children upright up to their necks and then stampeding horses across them. Undoubtedly the personal horrible small incident shocks and stirs, and these pictures are thus of some purpose. We are anæsthetic to mass figures and words like "5 million dead" glide easily off the tongue. Borodin reckons that the British are poor haters; that may be true, but propaganda milk needs to be very good if it is to make that cat into a tiger.

* * *

I recently came across the following phrase in an American medical journal: "The dull routine of the daily after-breakfast visit . . ." which set me thinking that for some of us the war has changed all that.

It was pleasant to sit in the little roofless wooden hut which the RE's in September, 1939, set up in a corner of the orchard in which our tents were pitched. A red-backed shrike started to build in a neighbouring tree next spring, and I would spend hours with my binoculars there. Two schools of thought arose at the onset, but I sided with that which held that hats should not be worn in such circumstances. It was unfortunately the duty as well as the joy of the farmer's boy to remove the buckets, which he did from behind and without warning. His "pardon Monsieur" was palpably insincere.

Then to the Middle East, where, in what was then the largest camp in the world, things were so planned that no-one could be further than 200 yards from a latrine. As however a large proportion of us usually had "gippy tummy" this was no mean hazard on a dark night with tent-ropes and slit trenches to surmount. They were arranged in rows of eight seats (compartments were dispensed with here), loosely encircled with sacking—apparently a vain endeavour to confine to each of these units its proper quota of flies. It was in Iraq and Persia that we first got to know the "Squatter." This seatless product of our Hindu dependants results in a good physiological position, but has its difficulties. The apparatus is encircled with rush matting which permits of sufficient infiltration by the rare local breezes to obviate the necessity for signposting, even on the darkest of nights. A further hazard in the shape of unfriendly scorpions resulted in two casualties.

On arrival in Malta we became joyfully aware of the presence of water-closets. Our joy was modified however on finding that, owing to the bombing, there was no longer any plumbing attached. We reverted to the deep trench as to an old friend. In Sicily we returned to nature for a period, owing to a lack of available RE's or tools. It is doubtful anyway if either could have been of much assistance, since nowhere was rock more than 8 inches beneath the surface. This was quite fun at first (there were bushes), but soon it became an offence to heaven, and a period of voluntary constipation became fashionable, to avoid intimate contact with what was probably the heaviest fly offensive of the war. This stage lasted for several weeks, and æsthetic equilibrium was in fact never established.

Now back in La Belle France—centre of all things civilised—we balance precariously along a 20 ft. pole beneath which is a bottomless pit. It is very sociable, but the preponderance in our diet of the excellent army biscuit renders our visits rare. It is rumoured that no case of peritonitis has yet occurred as the result of a perforating abdominal wound.

Epilogue.—It was reserved for my first visit to a prisoner-of-war cage to make acquaintance with the biggest and best so far. It is a 60-seater, without undercarriage. It would have delighted the author of that little classic "The Specialist." Every seat was occupied, and a medical orderly was on watch at one end for signs of dysentery.

Obituary

CHARLES FERRIER WALTERS

FRCS

OF late years Bristol surgeons have known Charles Walters, consulting surgeon to the Royal Infirmary, as EMS group medical officer, and many will recall his watchful care of the injured as they arrived in hospitals on blitz nights. Most of his life had been spent in Bristol. After qualifying from the London Hospital in 1900 he returned there at once to undertake a long series of house appointments at the Royal Infirmary and the Royal Hospital for Sick Women and Children. Having gained his fellowship in 1904 he was appointed to the BRI surgical staff; and he also demonstrated physiology in the medical school. During the war of 1914–18 he served in France at an emergency hospital and was one of the authors of an important paper, published in this journal in 1917, on 500 emergency operations for abdominal wounds. A surgeon of wide scope, he also wrote on intramedullary bone-pegging of fractures at a time when this was a novelty; he was on the staff of the Bristol Lock Hospital and was a leading spirit in starting the St. Brenda's nursing-home for semi-private patients. Rising in due course to senior surgeon at the Royal Infirmary he won the affection of many generations of students.

"Walters was renowned for punctuality and rapidity," writes A. W. A.: "during a list of operations, he was apt to be halfway through the next before his house-surgeon joined him. But he was more than a hustling surgeon; a man of catholic interests, he would weigh in with apt contributions to discussions on philosophy and metaphysics. He was never happier, however, than when wrestling with the mysteries of his monster car; or building a snug cottage for his family out of the local clay in the combe he had discovered for himself on the Bristol Channel. Here 'Piggy' welcomed house-surgeons and nurses, and some of us remember, many autumns ago, a grand bonfire of the shrubs and light timber cleared for the foundations."

Mr. Walters died on Christmas Eve, at the age of 69. His widow survives him with their daughter and an only son now serving in the RAMC.

THEOPHILUS NICHOLAS KELYNACK

MD VICT., MRCP

Dr. Kelynack, who died on Dec. 23, was a son of the Rev. N. Kelynack, and was born at Wells, Somerset, in 1866. After preparatory education he proceeded to University College School in its old premises in Gower Street—a school which has produced a goodly number of eminent medical practitioners. Forsaking London, he took his professional course at Owens College, Manchester, graduating MB with distinction in 1889, and MD with the gold medal in 1893. His early days of professional life were spent holding various appointments in the Royal Infirmary of Manchester, where he soon became pathologist and medical registrar; here he showed his keenness in pathology, and closely studied the vermiform appendix, publishing a valuable work on the pathology of that organ. He showed also his ability as a teacher and was appointed an assistant lecturer on pathology, and assistant to the then professor of medicine. Coming back to London, he obtained the coveted office of physician to Mount Vernon Hospital, an institution so eminently associated with the study and treatment of tuberculosis. His position there and his energetic research into all aspects of infection with the tubercle bacillus enabled him to become a recognised expert, and he wrote much which was highly useful on this disease, all too prevalent in those days. He was a skilled editor of the *British Journal of Tuberculosis* for 27 years, and also of the periodical *Child* from

Lafayette

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1910 to 1927. His aptitude for dealing with the infections of childhood also led him to accept, and to be of great help in, the posts of physician to the Sanatorium for Tuberculous Children, and medical adviser to the National Children's Home and Orphanage, and to the Shaftesbury Society. He found time to act as a justice of the peace for the county of London, and carried out his duties with that thoroughness for which he was renowned. But he was not content with the above activities, and perhaps he will be best remembered by his close study of, and writing upon, the subject of alcoholism and other drug addictions. He was editor of the *British Journal of Inebriety*, under the control of the Society for the Study of Inebriety, for no less than 38 years, also acting as hon secretary to the society for a long period. His work, *Drink Problem of Today*, has become a classic, and his numerous papers on the subject have been scattered over the world. He was elected a vice-president of the society in 1941, an honour which gave him considerable pleasure.

He married Violet McLaren, herself an MB, and well known in the Medical Women's Federation. Their only child, Agnes, has followed them in the medical profession, and is now on the secretariat of the British Medical Association.

W. Mc A. E.

On Active Service

CASUALTIES

WOUNDED OR INJURED

Surgeon Lieutenant K. V. J. KEARNEY, MB NUI, RNVR
Captain K. M. BELL, MB ABERD., RAMC
Captain ALAN LYELL, MB CAMB., RAMC
Captain D. J. TIBBS, MB LOND., RAMC
Captain J. P. WEISS, LRCPE, RAMC

AWARDS

MC

Captain K. B. FRASER, MB ABERD., RAMC

AFC

Squadron-Leader Samuel DAVIDSON, FRCSE
Squadron-Leader E. A. G. GOLDIE, MB CAMB.

MENTIONED IN DESPATCHES

Air Vice-Marshal F. C. Cowtan, CB, KHS
Air Commodore F. J. Murphy.
Group-Captains: J. D. Leahy, MC, R. H. Stanbridge, A. F. Cook, R. L. C. Fisher, R. G. James, F. E. Lipscomb.
Wing-Commanders: F. G. Mundell, R. Thorpe, J. G. L. Brown, J. R. Cellars, D. J. Dawson, H. A. Graham, J. F. MacCarthy, A. Muir, J. St. C. Polson, J. B. Ross, J. G. Stewart, C. Wollaston, J. L. Brown, D. M. Wallace, OBE
Squadron-Leaders: K. G. Bergin, P. M. Davies, L. D. A. Hussey, J. M. Kerr, M. L. Maley, A. T. M. Roberts, D. Skinner, W. H. C. Spooner, C. Bucknall, R. H. Carpenter, G. Clayton, C. V. Gledhill, J. Guthrie, T. A. Hale Monro, D. W. Higson, W. L. James, A. D. Messent, E. J. G. Murray, T. H. Redfern, C. O. Ribeiro, D. C. Russell, O. Scarborough, W. B. Waterfall, J. H. P. Gauvain (killed 14/8/44).
Flight-Lieutenants: D. Laing, W. J. Lynd, W. R. K. M. Parry, F. S. Rickards, J. E. Sharpley, A. C. Smerdon, J. G. Burgess, A. Standeven, P. W. G. Sutton, L. A. Sylvester, J. Taylor, R. G. M. Wedderburn, J. H. Wilkins, J. A. J. Wiseman.
Flying-Officer.—H. T. Foot.

MEMOIRS

Major ARTHUR WAYMOUTH, news of whose death in India on Nov. 10 has been received, was born in 1913, the only child of Mr. J. K. Waymouth of Westcliff-on-Sea. He was educated at Uppingham School, and Downing College, Cambridge, and at both he gained his rugby colours. He took his MA degree and the conjoint qualification in 1941, but he joined the RAMC before completing his MB final. His clinical work was done at St. Bartholomew's Hospital and he held several house-appointments there before he joined up. He sailed for India at the beginning of 1942 and was attached to a field ambulance of the 14th Army. He was mentioned in despatches for his work as leader of an expedition sent to rescue refugees from Schwinbyan, when the party was cut off from supplies of food and water for a fortnight. At the time of his death Waymouth held the rank of major, but he had already acted as a lieut.-colonel and his commanding officer, impressed by his ability, cheerfulness, and power of getting things done, had marked him for early promotion. A fellow of the Zoological Society, he was an authority on tropical fish and had contributed several articles on this subject to the *Aquarist*. He was also a keen boxer and had won several prizes in yacht races. He married Miss June Petit in 1941 and they had one daughter.

Fronne

Captain PHILIP ROBINSON, who died from wounds in Holland on Nov. 10, was born in Trinidad 33 years ago. As a boy he came to England and was educated at Stowe and Trinity College, Cambridge. He spent his years of clinical study at the Middlesex Hospital and after qualifying MRCS in 1935 acted for two years as demonstrator in anatomy. "When I came to Middlesex in the autumn of 1937," writes J. K., "it was my great fortune to find an excellent team of demonstrators who had already given good service to my predecessor, Prof. Thomas Yeates. Philip Robinson was the youngest member of this group but his place in the affectionate esteem of the students was already secure. His skill in dissection, and the facility with which he explained the apparently difficult and made it easy to understand because he himself thoroughly understood it, made him an ideal demonstrator. In him the students found a champion who could ease their burdens by winnowing the chaff and laying bare the essentials of a matter to the exclusion of unnecessary minutiæ and detail. He had an alert mind and he loved to share with others the facts which he himself had found useful in his clinical work." One of his fellow demonstrators recalls his jovial teaching and graceful manners and adds: "Robbie was an inspiration; not content with what the book says, he worked very hard to clarify, for instance, the perplexities of the layers of lumbar fascia as exposed in a nephrectomy; if you have tried it you will understand the difficulties. His exposition of the development of the pericardium was masterly. It is assumed in most dissecting-rooms that the demonstrator is recognised by the Gray tucked under his arm: Robbie was distinguished by forceps and scalpel."

Robinson's goal was the final fellowship and this would have been quickly reached but for the outbreak of war. On D-day, as an RMO, he landed with his men on the Normandy beach-head, and five months later he was still with them when the shell which killed him exploded on his regimental aid-post. "In the assault and in our hard battles north of Caen," writes his Colonel, "Philip was magnificent. He was always at his post ready for whatever happened. In the early difficult days he was an inspiration to me. . . . He was fearless, kind, and understanding, and thoughtful of the comfort and safety of others."

"Robinson's work in my surgical service," writes G. G.-T., "was characterised by the same enthusiasm and excellence that he had displayed in every previous appointment and sphere of activity. After he joined the RAMC, chance occasionally brought us together for a few brief moments in the south-east corner of England, and as the war went on and the years slipped past, there was no self-pity, no repine that he had not yet attained the surgical diplomas which might have put a specialist post within his grasp. He was content to serve his fellow men in the battlefront, and he died as he had lived, true to the Virgilian motto of the hospital that cradled him."

Captain Robinson married Miss Kitty Pope and they had one son.

THE following appointments have been made in the health division of UNRRA:

Colonel V. P. SYDENSTRICKER to be chief nutritional adviser to the health division in the European regional office. Dr. Sydenstricker is professor of medicine at the University Hospital, Augusta, Georgia, USA, and during 1942 as a member of the Rockefeller Foundation health commission carried out a survey of nutritional health in England on behalf of the Ministry of Health.

Lieut.-Colonel T. B. LAYTON, DSO, to be district medical officer to the mission to Italy. Mr. Layton is surgeon in charge of the ear, nose and throat department of Guy's Hospital.

Dr. E. C. BENN to be epidemiologist to the mission. Dr. Benn is superintendent of the city hospitals, Leeds, and lectures in infectious diseases at the University of Leeds.

Dr. J. A. FITZGERALD to be camp medical officer to the mission. Dr. Fitzgerald, who has served in the Colonial Medical Service in West Africa, has lately been employed by the Ministry of Health on nutrition surveys in this country.

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Notes and News

OLD FOLKS NOT YET AT HOME

THE London County Council have been considering one-room flats for old people, but owing to the urgent need of homes for larger families, only 584 such flats have been provided out of 98,749 dwellings. Some are in blocks, while others are in special two-story buildings—containing both one- and two-room flats—on cottage estates.

The Council feel that old people should not be segregated but should keep touch with the life of the neighbourhood. For those who are able-bodied they hope to provide more flats of the kinds described, but for those who need some help different provision is needed. It would be possible, the Council think, to ensure for each of these a semi-independent life in a separate room on certain housing estates where there are to be special communal cooking and bathing facilities. These tenants would be under the general care of a resident woman supervisor provided by the social-welfare committee. Any so infirm that they needed institutional care would be looked after in small buildings on the lines of the Council's present homes for the aged, managed by the social-welfare committee. It is thought that these resident homes should be situated on the housing estates where the semi-independent old people are living: the staff of the institution could then help these old tenants with their housework, or in other ways.

One-room dwellings are relatively costly to build. In 1938 it was estimated that, after allowing for the cost of the land, and assuming that the average weekly rent would be 3*s.* 4*d.*, the deficiency would be £19 per flat per year for 40 years. The Council has approached the Ministry of Health to find out what subsidies will be allowed, and whether further powers will be required to make the services of institutional staffs available to old people living in flats and needing occasional help with their household work. Once they are reassured on this point, they hope to go ahead with providing accommodation on the lines suggested.

FILMS FROM THE USSR

FOUR films from the Soviet Union were shown privately at the Torch Cinema recently to an attentive audience. One of these (*Revival of Organisms*) has already been reviewed in our columns (*Lancet*, 1942, ii, 383).

Academician Pavlov is a combination of two older films. It shows Pavlov at work, and his surroundings. From his initial experiments on conditioned reflexes in dogs we are taken on to his study of chimpanzees when faced with problems, and their behaviour is amusing as well as interesting. This film will be useful for semimedical audiences, and as a filler for more specialised programmes.

Rehabilitative Surgery is a long film dealing with nerve injuries and surgical repair. It falls into four parts: the first shows various types of nerve lesion in diagram; the second shows the clinical appearances of different nerve lesions of the limb, and is the best part of the film; the third demonstrates surgical repair as carried out in Russia; and the fourth shows—not very convincingly—the end-results of the operations. The pictorial quality is poor, with the image jigging about the screen all the time. The running commentary is in English.

A Rare Operation is a short film recorded by a news-reel cameraman of an operation for removal of a piece of shrapnel from a soldier's heart. It is a striking record, for the patient recovered and is seen walking out of the hospital at the end. An English commentary is being prepared.

The four films can be obtained from the Soviet Film Agency, 5, Kensington Palace Gardens, W8. Since they have sound tracks they cannot be used on a silent projector.

ADVICE BEFORE AND AFTER MARRIAGE

THE Marriage Guidance Council held its annual general meeting recently at the Caxton Hall, Westminster. The report for the past year noted that membership has doubled, that new branches have been formed in the provinces, and that the London centre had dealt with 650 cases. Extension of the work has been somewhat hindered by lack of funds and office staff.

At a conference held before the meeting, preparation for, and guidance in, marriage were discussed from the medical, the psychological, and the spiritual points of view. The value and content of an interview between engaged couples and a doctor was explained by Dr. Lilias Jeffries. Dr. Edward Griffith reported cases illustrating the help which can be given to couples in difficulties, and Mr. Claud Mullins, as a magistrate, reaffirmed his belief in the value of conciliation by trained and sympathetic officers before a couple in disagreement appeared in court. Once there, the case cannot be considered from its human aspect, but can only be argued on its legal basis.

AN AFRICAN MISSION

Dr. Albert Schweitzer, philosopher, organist, and surgeon, who turns 70 on Jan. 14, comes from Upper Alsace. He began his work at Lambaréné, on the banks of the Ogowe River, in 1914, in a disused fowl-house. His hospital now consists of some fifty buildings, and he has been treating the negro population of the region since that time. Before the war he used to spend his leaves in Europe—exacting furloughs given up to lecture tours, organ recitals, and writing. In these ways he raised the funds to continue his work in Africa. The bulletin of his hospital council, in a special birthday issue, tells how he came home in 1939 for one of these dynamic holidays. Threats of war met him, and fearing lest he might be separated from the people he serves, he hurried straight back to them without unpacking. Since then he has been continuously at work in Africa. A list of the sums sent by his friends and admirers to support his undertaking show what sympathy this has inspired. The treasurer of the council may be addressed at 5, Castleton Mansions, London, SW13.

University of Oxford

On Dec. 16 the degree of DM was conferred on Celia K. Westropp.

Royal College of Physicians

On Tuesday and Thursday, Jan. 16 and 18, at 2.30 PM, Lieut.-Colonel C. H. Stuart-Harris will deliver the Goulstonian lectures at the college, Pall Mall East, SW1. His subject is to be influenza epidemics and the influenza viruses.

Mr. Desmond MacCarthy, LL D, will deliver the Lloyd Roberts lecture at the college on Tuesday, Jan. 30, at 3 PM. He is to speak on psychology in literature.

Royal Society of Medicine

Sir Arthur MacNalty has been elected president of the history of medicine section in succession to the late Dr. J. F. Halls Dally.

A meeting of the fellows of the society will be held at 1, Wimpole Street, London, W1, on Tuesday, Jan. 16, at 5 PM. On Jan. 19, at the section of obstetrics and gynæcology, Prof. A. St. G. Huggett and Dr. J. J. Pritchard will speak on experimental fœtal death. On the same day, at 6.30 PM, at the section of radiology Dr. C. L. Sutherland and Dr. A. W. Fawcett will open a discussion on industrial lung diseases.

Tuberculosis Association

At a meeting to be held at 26, Portland Place, London, W1, on Friday, Jan. 19, at 3.30 PM, Dr. E. T. Fletcher will speak on ankylosing spondylitis and tuberculosis, Dr. R. B. Illing on chronic miliary tuberculosis in children, and Dr. M. C. Wilkinson on resistance in tuberculosis.

British Institute of Radiology

On Thursday, Jan. 18, at 8 PM, at 32, Welbeck Street, London, W1, Mr. T. Pomfret Kilner, FRCS, Mr. Stevenson Clark, Miss Shaw, and Mr. F. W. Coppin will take part in a symposium on clinical photography. Medical members of the institute will meet the following day at 5 PM.

Therapeutic Research Corporation of Great Britain

The following officers have been elected for 1945:

Board of Directors—Lord Trent (Boots) chairman, and Mr. F. H. Carr, D SC (BDH), deputy chairman.

Research Panel: Mr. F. A. Robinson (Glaxo) chairman, and Dr. C. H. Kellaway, FRS (Wellcome Foundation), deputy chairman.

Order of St. John of Jerusalem

The King has sanctioned the following promotions in, and appointments to, this order:

As Knights.—Major Alfred Tennyson Smith, OBE, MD, and Captain Richard Williams, MRCS.

As Commander.—John Phimister Mitchell, OBE, MD.

As Officers.—William Frederic James Whitley, MD, FRCS, William David Jenkins, MRCS, and Thomas Blanchard Sellors, MD.

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British Dental Association

Today, Saturday, Jan. 13, at 2.30 PM, the industrial dental officers' division will hold their inaugural meeting at 13, Hill Street, London, W1. Sir Alfred Webb-Johnson, FRCS, will speak, and members of the medical profession will be welcome.

Eugenics Society

On Tuesday, Jan. 16, at 5 PM, at the rooms of the Royal Society, Burlington House, Piccadilly, London, W1, Mr. Cecil Binney will speak on eugenics and criminal law.

Red Army Flag Day

The Joint Committee for Soviet Aid is to hold a flag day in the Greater London Area on Red Army Day, Feb. 23, to help to provide rehabilitation equipment for the Russian wounded.

The Salmon Lectures

Brigadier J. R. Rees, consulting psychiatrist to the British Army, delivered the Thomas W. Salmon lectures at the New York Academy of Medicine on Nov. 20–22.

Royal Society of Tropical Medicine and Hygiene

A meeting will be held at 26, Portland Place, London, W1, on Thursday, Jan. 18, at 3 PM, when Brigadier N. Hamilton Fairley, FRS, will speak on chemotherapeutic suppression and prophylaxis in malaria.

Andrew Graham Ritchie Bursary Fund

The friends of the late Dr. A. G. Ritchie are raising a fund in his memory, the income of which is to be applied to providing a bursary in the faculty of medicine of the University of Edinburgh. Preference will be given to sons and daughters of doctors. Contributions should be sent to Miss Norah Macfarlane, 57, Fountainhall Road, Edinburgh, 9, or to Miss Grace Alison, 46, Heriot Row, Edinburgh, 3.

Ophthalmological Society of the United Kingdom

The annual congress of the society will be held on Friday and Saturday, April 13 and 14, at 1, Wimpole Street, London, W1. The subjects chosen for discussion are the ocular sequelæ of head injuries, and plastic repair of the lids. Further information from Mr. Frank Law (hon. secretary), 36, Devonshire Place, W1.

Whole Blood from USA

Whole blood collected in San Francisco, Oakland, and Los Angeles is now being flown across the Pacific packed in ice. Over 200 pints a day is now being called for to make the 3-day flight. Whole blood collected in New York, Boston, and Washington crosses the Atlantic within 24 hours for use in Europe.

US Army Medical Department

It was announced on Nov. 30 that the present strength of the medical department of the United States Army is 680,891. The total includes about 15,000 in the dental corps, 2000 in the veterinary corps, 15,000 in the medical administrative corps, 40,000 in the army nurse corps, and 1334 hospital dietitians.

Postgraduate Lectures at Edinburgh

The following Honyman Gillespie lectures will be given at the Edinburgh Royal Infirmary on Thursdays at 4.30 PM during the spring term: Prof. C. F. W. Illingworth, gastric function in relation to the treatment of peptic ulcer (Jan. 18); Mr. G. H. Macnab, actinomycosis (Jan. 25); Dr. R. Y. Keers, pulmonary tuberculosis (Feb. 8); Dr. A. E. Ritchie, physiology of peripheral nerve injury (Feb. 15); Dr. Robert Aitken, dermatitis (Feb. 22); and Dr. John Gillies, intravenous anæsthesia (March 8).

List of Medical Films

The medical committee of the Scientific Film Association have published their first handlist of films of medical interest. This gives a synopsis of 12 recent films and gives details of where to get them. Such lists, which are to be published at intervals, can be obtained from the hon. secretary. A series of film programmes are to be presented on the fourth Thursdays in February, March, April, and May at 5.30 PM and again at 8 PM. Season tickets admitting to all four shows from the hon. secretary of the medical committee, Dr. S. J. Reynolds, 14, Hopton Road, SW16.

CORRIGENDUM.—In Surgeon Lieut.-Commander Percival's article of Jan. 6, p. 16, second paragraph of Discussion, read: "... in the cases treated personally the stones have not exceeded 1 cm. in diameter."

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED DEC. 30

Notifications.—The following cases of infectious disease were notified during the week; smallpox, 0; scarlet fever, 1512; whooping-cough, 1179; diphtheria, 446; paratyphoid, 6; typhoid, 4; measles (excluding rubella), 8870; pneumonia (primary or influenzal), 812; puerperal pyrexia, 99; cerebrospinal fever, 38; poliomyelitis, 6; polio-encephalitis, 0; encephalitis lethargica, 0; dysentery, 123; ophthalmia neonatorum, 52. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Dec. 27 was 947. During the previous week the following cases were admitted: scarlet fever, 45; diphtheria, 15; measles, 55; whooping-cough, 24.

Deaths.—In 126 great towns there were no deaths from enteric fever, 14 (0) from measles, 1 (0) from scarlet fever, 7 (1) from whooping-cough, 11 (1) from diphtheria, 44 (1) from diarrhœa and enteritis under two years, and 35 (1) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 3 deaths from measles. There were 6 fatal cases of diarrhœa at Birmingham.

The number of stillbirths notified during the week was 181 (corresponding to a rate of 33 per thousand total births), including 15 in London.

Appointments

The Colonial Medical Service announces the following appointments:

FENDALL, N. R. E., MB LOND.: MO, Nigeria;
ELMES, B. G. T., MD EDIN., FRCPE: asst. director of laboratory Services, Nigeria;
LESTER, H. M. O., OBE, PH D LOND., MRCS: ADMS, Nigeria.
LOCKHART, F. R., MB MANC.: DDMS, Kenya.
SNEATH, P. A. T., MD TORONTO: DDMS, Tanganyika.
YOUNG, S. M., MB MELB.: MO, Sierra Leone.

Births, Marriages, and Deaths

BIRTHS

BOLTON.—On Dec. 28, at Belfast, the wife of Dr. Sloan Bolton, of Portrush—a son.
BONEY.—On Dec. 28, to Mrs. Hilary Boney (née Long), FRCS, wife of Lieut.-Colonel Knowles Boney, MRCP, RAMC—a son.
BROCKLEBANK.—On Jan. 5, at Salisbury, the wife of Major J. A. Brocklebank, RAMC—a son.
EDKINS.—On Dec. 30, in London, the wife of Dr. J. R. P. Edkins—a son.
FRAZER.—On Jan. 1, in London, the wife of Prof. A. C. Frazer, MB—a son.
PENN.—On Jan. 2, in London, the wife of Surgeon Lieut.-Commander E. A. Penn, DSC, RN—a son.
PRICE.—On Dec. 28, at Newcastle-on-Tyne, the wife of Captain G. C. Price, RAMC—a son.
WALTERS.—On Dec. 25, at Elstree, the wife of Captain C. M. F. Walters, RAMC—a son.

MARRIAGES

GOWAR—ROGERS.—On Dec. 8, in Colombo, Frederick John Sambrook Gowar, FRCS, surgeon lieut.-commander RNVR, to Dorothy Mary Rogers, QARNNS (R).
LEAHY—LUMBY.—On Dec. 30, at Bath, Patrick Leahy, MB, to Rosemary Lumby.
SCOTT—HUDSON.—On Dec. 28, at Gloucester, Ronald Leslie Scott, MB, wing-commander RAF, to Gwendoline Mary Hudson.
VENNING—BARKER.—On Jan. 2, at Heaton, Bradford, Geoffrey Richard Venning, lieutenant RAMC, to Mary Ruth Barker.

DEATHS

CHARTRES.—On Jan. 5, at Southbourne, Edward Acheson Chartres, FRCSI, lieut.-colonel RAMC retd.
DACRE.—On Dec. 30, John Dacre, MRCS, of Bristol, aged 83.
DORMAN.—On Dec. 30, at Kinsale, co. Cork, John Cotter Dorman, CMG, MB DUBL., major-general late RAMC retd, aged 92.
GRIFFITHS.—On Jan. 4, at Cambridge, Joseph Griffiths, CMG, MD EDIN., FRCS, aged 81.
HARTLEY.—On Jan. 2, at Bournemouth, John Hartley, MB MANC.
HORSBURGH.—On Jan. 3, at Ryde, Edward Leslie Horsburgh, MD LOND.
MACASKIE.—On Jan. 3, at Seahouses, Northumberland, James Griffiths Macaskie, LRCP, aged 89.
NOLAN.—On Dec. 27, at Newcastle, co. Down, Michael James Nolan, LRCPI, formerly superintendent, Down Mental Hospital, JP.
O'MULLANE.—On Jan. 2, in London, Jerome John O'Mullane, BA, MB, aged 52.
OWENS.—On Jan. 3, at Hersham, Surrey, Terence Francis Owens, LRCPE, lieut.-colonel IMS retd., aged 66.
RIDDICK.—On Dec. 20, George Bushman Riddick, MRCS, lieut.-colonel RAMC retd, aged 73.
SAYER.—On Dec. 31, in London, Thomas Sayer, MD BRUX., MRCS, aged 90.
WYNTER.—On Jan. 4, at Newbury, Berks, Walter Essex Wynter, MD LOND., FRCP, FRCS, aged 84.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

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MANAGEMENT OF HOSPITALS IN PEACE AND WAR*

SOMERVILLE HASTINGS, MS LOND., FRCS
CHAIRMAN OF THE LONDON COUNTY COUNCIL

I DESIRE to bring before you some observations on the administration of hospitals in peace and war. I need hardly remind you that I shall be speaking only for myself and not for any organisation with which I happen to be associated. Moreover, I am not proposing that all these suggestions are immediately practicable. They are, I believe, ideals to be aimed at, rather than proposals to be carried out everywhere at once.

THE GENERAL FRAMEWORK

I want to speak of hospitals as hospitals—that is, living dynamic organisations—and am not proposing to discuss how they should be planned and built, or whether they should be municipal or voluntary.

Nevertheless, the time has long passed when a hospital can be looked upon as an isolated unit, for no single hospital can economically provide for every type of patient who may require treatment. It is generally agreed, I think, that the best medical and surgical work is usually carried out in the wards of a large general hospital. Some would suggest that in association with such a hospital there might be pavilions for infectious disease and tuberculosis, though I do not regard this myself as desirable. Neither do I feel that declared mental disease is best treated in connexion with a general hospital, although at least one of a group of two or three general hospitals should have wards or a separate block for the observation of early acute cases of mental diseases, as well as for the treatment of those not requiring certification, because in both there is often some physical illness that needs attention at the same time. This also has the advantage of readily accessible psychiatric advice for any patient in the general wards who needs it. A good many cases of chronic illness, after thorough investigation in a general hospital, can be usefully transferred to hospitals where they can stay longer. Institutions for younger patients, such as those with chronic heart trouble or requiring rehabilitation treatment, are best situated in the country; but old people, who are not likely to recover, will be much happier in hospitals near their homes.

With the exception therefore of fevers, tuberculosis, declared mental disease, and some chronic cases, most patients needing hospital care are best dealt with within the wards of a large general hospital. For every unit of population of about 100,000 one such hospital of approximately 800 beds will be necessary. There is therefore, in my view, no place in the ideal system for the small cottage hospital, for the patients of such hospitals and their friends are certain to urge upon their doctors the treatment of conditions for which they have neither the experience nor the facilities. The continued education of the general practitioner is much better secured by associating him closely with the work of the large general hospital and by revision courses. Neither is there, in my view, any place for what are generally described as special hospitals; for you cannot cut the body up into little bits and treat each part separately.

It is not suggested, however, that every general hospital should have special departments for the in-patient treatment of every disease. There should be medical, surgical, gynæcological, and perhaps maternity wards in every hospital, but for specialties such as eyes, skins, ear, nose and throat, hospitals should be grouped and wards provided for such cases in one of a group of three or four. For specialties less often in demand, such as neurosurgery, chest surgery, thyroid surgery, plastic surgery, and radiotherapy, a single department for a group of eight or ten hospitals may be sufficient. It is of course assumed that officers in charge of a special department will attend and give advice at any hospital of the group, although for the treatment of ordinary cases beds will be provided in only one hospital.

Children present a peculiar problem, forming as they do a special type of patient, subject however to diseases of every kind and of every part of the body. There should be a pædiatrician attached to every maternity department. In addition it may very often be advantageous to have children's wards in one hospital of a group of three or four, when geographical conditions make this possible. Probably, however, the best arrangement of all is a hospital for children only, with its special departments for diseases of different regions, and a hospital school attached to it for long-stay cases in the country.

If the foregoing principles are accepted, even in general terms, it will be agreed that what is necessary is not a number of independent hospitals but a hospital system such as, for instance, that of the joint authority contemplated by the Government's white-paper on the health services. Such a body will have many and important functions. It will have to determine the conditions of service of the staff of all its hospitals, and costing arrangements, as well as the type of case to be admitted to each hospital, and this last may have to be altered at short notice in case of epidemic or emergency.

This then is the general framework into which all hospitals will have to fit. We can now pass to the more detailed examination of each individual hospital.

MANAGEMENT COMMITTEES

Every hospital should have its own committee of management. In the past this committee has been in complete control in the case of the voluntary hospitals, each of which has usually acted as an isolated unit. If, however, there is to be a hospital system all the really important decisions will have to be made by the central coördinating body. To what extent then is there a place for a committee of management of each individual hospital? Would it not be better to group hospitals for this purpose or abolish local committees entirely? One obvious advantage from the point of view of the hospital staff would be the avoidance of the duplication of authority—there would be one committee only to satisfy instead of two. Nevertheless in my opinion every hospital ought to have its own committee of management, and I would delegate to such a committee all decisions that can safely be left in its hands, remembering that variation is essential for evolutionary progress.

One of the most valuable assets of the voluntary system has been that through committees of all sorts, and other means, people of a district have been induced to take an interest in their local hospital and feel that it is their own. Even if in the future hospitals should be mainly or entirely supported by public funds, I hope these committees will continue and be extended to all hospitals. It is good for a hospital to be in intimate touch with the public that uses it. It is good for the staff to realise that their labours are known and appreciated. However complete the public provisions may appear to be, there will always be funds to be provided, personal services rendered, and experiments in social service carried out, by voluntary effort. In addition to committees of management, most hospitals will therefore benefit by samaritan, aftercare, entertainments, library, and other committees. To the committee of management should be allocated the appointment and discipline of the junior staff, the carrying out of cleansing and minor repairs up to an agreed sum, and other matters. Its main duty will be, however, to make recommendations to the central committee which will have to consider these not only as they affect the particular hospital but also the service as a whole.

STAFF COMMITTEES

To what extent should the staff of a hospital be in a position to influence its administration? I am of opinion that every member of the staff—medical, nursing, and lay—should not only realise the importance of the work he or she is doing, but should also feel assured that any suggestions he may desire to make for the more efficient running of the hospital will receive appropriate consideration. It must be made clear from the very first that if staff committees are formed, they must be advisory and not executive, and deal solely with means of improvement of the services provided by the hospital. Discipline, rates of pay, and conditions of service must be entirely outside their terms of reference, being dealt with by national committees, trade-unions, or similar organisations.

* Lecture delivered in London on Oct. 13, 1944, under the Chadwick Trust.

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The medical superintendent, where one exists, and all members of the senior and intermediate medical staff, should be members of the medical staff committee. The junior staff should also appoint representatives. The committee should elect its own chairman. It has been suggested that if there is a medical superintendent he should ipso facto be chairman of the committee. This appears to me undesirable and liable to limit freedom of discussion and recommendation. The terms of reference of the committee should be wide and should include such matters as accommodation, staffing, teaching, research, and equipment. Certain of the recommendations of the medical staff committee will be within the jurisdiction of the hospital superintendent, and if he is in agreement they can be carried out at once. Otherwise they will come before the hospital committee with other matters within the terms of reference of that committee. Other recommendations will go to the central coördinating body either direct or (perhaps better) through a central medical staff advisory committee formed of representatives of the medical staff committees of all the hospitals in the unit.

The nursing staff committee should have a similar constitution. It should consist of representatives elected by student nurses of the first, second, third, and fourth year, of staff nurses, ward, and administrative sisters, and also assistant and male nurses, if employed. Each of these categories should meet independently to discuss problems and elect representatives. It is probably best that in most hospitals the matron should not be a member of this committee, but recommendations made to the hospital management committee would be seen by the matron and she would no doubt in many cases report to that committee that she had already taken the necessary action. A central nurses' advisory committee formed of representatives of the local committees to deal with questions of general application and to report direct to the central coördinating body might also be desirable.

In at least one hospital at the commencement of the present war the medical superintendent called together representatives of every grade of staff and asked for suggestions for the running of the hospital during the difficult times ahead, and this committee has been meeting at intervals ever since. Joint production and efficiency committees have proved of value in industry and ought to be tried out in hospitals. They would have nothing to do with staff matters, but would make it possible for every employee of the hospital to make suggestions for its more efficient running. These staff advisory committees should be formed of representatives of every grade of staff and make recommendations to the hospital committee.

CLINICAL UNITS

Every general hospital will require at least three departments—medical, surgical, and gynæcological. The medical will usually be the largest, for it will include the chronic sick. Each department, general or special, should be staffed on the "clinical unit" system—that is to say, there should be a physician or surgeon of consultant status, who would be in complete clinical charge, with an assistant, one or two registrars, and a variable number of junior and senior house-officers. In the case of the special departments the clinical unit would be centred in one general hospital, but the doctor in charge or his assistant would attend at other hospitals as required, and also, it is hoped, at health centres and to see patients in their own homes.

THE SUPERINTENDENT—MEDICAL OR LAY?

Perhaps it may be useful at this stage to consider the much discussed question of whether the superintendent or director of a hospital should be a doctor or a layman. At Guy's Hospital there is a medical superintendent and a lay clerk to the governors, each responsible for matters within his own sphere, and the system apparently works well. But in most hospitals it is found to be more convenient to have one person responsible for the general administration of the whole institution, leaving the clinical care of patients to the doctors in charge. Should this superintendent be a doctor or a trained layman?

In the case of hospitals for infectious and mental diseases and tuberculosis the decision should be easy. The cases are all of one type, and, the sphere being limited, it is possible for a single individual to become an expert in all maladies dealt with in that particular hospital. The chief clinical officer will therefore naturally become the head of the hospital. In the case of infectious disease, especially, he may well also become the clinical consultant of his district.

In the past, the officer in charge of a municipal hospital has been a doctor, but in a voluntary hospital it is usual to appoint as secretary-superintendent a layman. It is clear that no single doctor can have sufficient knowledge and experience to deserve a place as the head of each of the clinical units into which a hospital is divided, and accordingly it has been suggested that one of the heads of the clinical units should act as medical superintendent and that the individual selected should be changed every few years. This suggestion has in my opinion nothing to recommend it. A good clinician is but rarely a good administrator; nor would one expect the head of a clinical unit who was really keen on his work to be willing to leave it even for a few hours daily to undertake the administrative control of a large hospital. Nevertheless, there is much to be said for the superintendent of a hospital being a qualified doctor. A man with medical experience is in a much better position to deal with complaints of patients and their friends, as well as to solve the administrative problems which a committee may present to him. In matters of discipline and the allocation of duties among the medical staff the medical administrator has a distinct advantage. Moreover, it is clear that in the future hospitals will function as a system and not as a series of isolated units. This must imply not only some central control, but also at times rapid change of use of wards or even whole hospitals. A doctor will be in the best position to carry out instructions of this nature.

The work of a medical superintendent is both important and absorbing, but if such an individual is to maintain his keenness and breadth of outlook it is probably desirable that a portion of his time should be devoted to other duties, as for instance the medical care of the resident staff or some branch of medicine or surgery in which he is interested. I have seen the work of medical superintendents who are also pseudo-specialists, and it has not in every case been such as to enhance the respect due to them from those under their administrative charge. A better proposal is as follows. It seems pretty clear that some form of National Health Service is on the way. If, as has been suggested, the country is divided up into units of 100,000 people with wherever possible a large general hospital in each, it might be desirable for the medical superintendent of the hospital to act administratively as supervisor also of the consultant services of this unit and also of the health centres or other general-practitioner services.

When a hospital stands as an isolated unit its superintendent, be he medical or lay, will have to advise the committee of management, which is in complete control, and his responsibility will be great. When, however, a hospital is one of a group or system, all major issues will be decided by the central coördinating body, and the superintendent will be able to consult the permanent staff of this body in case of doubt. In either case the superintendent should have an intimate knowledge of the law as it affects hospitals, accidents, and employees, as well as mental and infectious disease and public health generally. Although there will usually be an engineer to advise on problems of maintenance of buildings, heating, lighting, and so on, and a steward to deal with accountancy and supplies, the superintendent should have considerable knowledge of these also. It seems desirable therefore that all those aspiring to an administrative staff appointment or to become the superintendent of a hospital should be encouraged to take a diploma in hospital administration. It may also be said generally that an officer who has had some experience of central administrative staff work will make a better hospital superintendent.

FULL-TIME OR PART-TIME STAFF?

In my opinion the best results are likely to be obtained if the medical staff of a hospital are full-time officers. I am well aware that the consultant, who visits patients of the well-to-do in their homes, is supposed to derive

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from this a breadth of outlook unobtainable by any other means. I unhesitatingly agree that for a full understanding of its natural history, disease must be studied as it occurs in the homes and work-places of the people. But surely the consultant who, as proposed in the white-paper, visits, when necessary, any person of whatever class, however lowly, in his home will have a better knowledge of ætiology than one who, as at present, sees no more than a favoured few. By visiting patients in their homes, by outpatient as well as inpatient work, by constant contact with colleagues in every branch of practice and perhaps most of all by research work, the full-time hospital doctor should find no difficulty in maintaining interest and keeping himself up to date. Visits to other clinics in this country and abroad should be encouraged, as well as attendance at national and international conferences.

The hospital doctor, whether a full-time officer or not, should live within a short distance of the hospital in which his patients are warded. The treatment of disease, both medical and surgical, is a continuous process in which the highest skill available may be required at any time. There can of course be no objection to the consultant or specialist travelling some distance from his home to give an opinion, but the surgeon who attends a cottage or other hospital at weekly or fortnightly intervals and undertakes routine operative treatment at these visits is in my opinion asking for trouble.

But while all doctors should live near the hospital in which their patients are housed, comparatively few ought of necessity to live in. In the past, I think, many hospitals, especially municipal, have asked too much of their medical staff. Of course there must always be some doctors on the premises to deal with such sudden emergencies as severe bleeding or suffocation. There must also be highly skilled personnel on call. Fortunately, however, there are very few cases in which serious harm will result from waiting the 10 or 15 minutes that it should take such assistance to reach the hospital. The doctor who, living near the hospital, spends most of his leisure in his home, will usually be of greater value than the resident who spends all his available free time in visiting his wife or friends some distance away.

PROFESSIONAL AND POLITICAL FREEDOM

A great deal has been written regarding the need for complete professional, intellectual, and political freedom for members of the medical profession. If, as seems likely, some 90–100% of the doctors will become engaged in the public service either whole or part time, to grant anything less would be to disenfranchise the profession. And this must apply not only to the doctors but to other health workers as well. All must therefore have the right to speak or write anything they desire. All must also have the right to stand for Parliament. In the past a teacher employed in the State schools has been allowed to become a member either of any local authority or of any but the one that employs him. To apply any such restriction under the set-up envisaged by the white-paper with a joint hospital authority covering a large area, would be to exclude doctors and other health workers from sitting as elected representatives of an area in which their local knowledge could be of particular value. Might it not be sufficient if the usual rule were applied, and such representatives asked to withdraw whenever their financial interests were directly or indirectly affected by the matter under consideration?

WORK AND PROMOTION

A few other points in connexion with medical staffing may be mentioned. It takes many years of training and experience, gained unfortunately by failure as well as success, to make an efficient doctor. Surely everything should be done to make the most effective use of experience gained at so great a cost. To expect therefore such an individual to write letters and keep notes of cases, when this can be done both more quickly and efficiently by a shorthand-typist, is wasteful in the extreme. The provision of such assistance will be found to increase the output of work of many hospital doctors considerably.

One of the weaknesses of the voluntary hospital system is fixity of staff, many of whom, like myself, have remained attached to the same hospital continuously since their student days. It is rarely that a doctor under 40 should remain for more than 5 years at one hospital, and a medical superintendent, whatever his age, ought to change his hospital fairly frequently. Some little experience has convinced me that, with very few exceptions, a medical superintendent has made his greatest contribution to any one hospital within 10 years of his appointment to it.

And now a word about promotion. It is human nature to prefer the known to the unknown, and the committee of management of a municipal no less than of a voluntary hospital generally exhibits a strong tendency to appoint the man or woman on the spot rather than a stronger candidate from outside. The only way to avoid this danger is by having a large unit of hospital administration. Junior or house officers might well be appointed by the committee of management of a hospital in consultation with the medical superintendent and head of the clinical unit concerned. All above this rank should be elected by the central coördinating body or a committee appointed by it. But while it is essential that the final selection should be made by this body, the short-listing, if not indeed the placing of those selected in order of merit, should be carried out by a body of experts. For clinical appointments the short-listing committee should consist of the heads of clinical units in the branch of practice concerned, together with representatives of the central staff: for administrative appointments there should be representatives of the medical superintendents and central staff. It is to be hoped that before long all hospitals of any size will take their place in a scheme for undergraduate or postgraduate education. In that case university representatives should be added to the short-listing committee for all senior appointments which may involve teaching.

STUDENTS

At this point I would like to interpolate a few words about the value of students to a hospital. All who have engaged in clinical teaching will realise how useful to the teacher is the impact of young, vigorous, and critical minds. But that is by no means all. Students bring a breath of fresh air from the outside world which is felt by all—nurses, patients, everyone. Where students are widely distributed, as they must be for efficient clinical instruction, few patients will object to their presence for they realise that fresh facts are often brought to light by the discussion of their cases. The presence of students, either undergraduate or postgraduate, adds to the prestige of a hospital and improves both the status and efficiency of its staff.

NURSES

I shall not venture more than a few general observations on the administration and conditions of service of the hospital nursing staff. The student nurse must be regarded much more as a student and much less as a source of cheap labour than at present. With this in view she must be given a chance to gain experience in the nursing of as many different types of patient as may be required, even if this necessitates a change of hospital. She should work a 48-hour week or less, and these hours should include not only all lectures and classes but also an hour a day spent compulsorily in library or classroom for study or the writing up of lecture notes. The only satisfactory way to study a clinical profession is to read up details of the work on which one is actually engaged, and every student nurse must have ample opportunity for doing this.

Unless the student nurse's home is reasonably near the hospital she should reside within its curtilage during her student days. She should be housed in a hostel presided over by a warden, who should be responsible to the medical superintendent for the order of the hostel and well-being of the nurses. As much freedom should be granted as is consistent with the important duties that the student nurse has to perform, and while the matron of the hospital should maintain strict discipline as long as the nurse is on duty or in the classroom, her jurisdiction should abruptly cease directly the nurse leaves the hospital.

There is a good deal to be said for making the residence in hospital of all State-registered nurses and sisters

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optional. Given a comfortable bed-sitting-room and facilities for entertaining visitors there are many nurses who prefer to live in a hostel with friends and colleagues; and especially is this the case during difficult times like the present. On the other hand there are some who feel that the complete freedom that they desire is impossible under these conditions. There is no doubt that the right thing is to leave the matter to be determined by the individual nurse or sister, but this uncertainty of demand gives rise to serious difficulties on the part of those responsible for the provision of hostel accommodation. The nurse who marries and sets up a home will of course live out. She should be required to give up nursing only temporarily before and after childbirth.

PRIVACY FOR PATIENTS

People vary greatly as regards their reactions to their fellow beings. Some, perhaps because they have lived under more or less overcrowded conditions all their lives, cannot bear to be left alone even in sickness. Others, when ill, desire solitude beyond all else. It would not be very expensive to change all hospital wards into curtained cubicles, and I am hopeful that this may be achieved within a few years of the end of the war. The provision of curtains, together with the occasional change of the position of patients in the wards, should go far to satisfy the wishes of most. But in addition, for those who are acutely ill or noisy or in any way likely to disturb others, a supply of single-bedded side wards is essential. Surgical cases are especially liable to be restless during the first night after operation. It is useful therefore to have a section of a surgical ward partitioned off by a glass screen. To this section new cases are admitted, and in it they remain until the day after operation, when they should be transferred to the other part of the ward.

Should wards or rooms for paying patients be provided in hospitals and should payment be for privacy and extra amenities only? Or should there be in addition fees to the doctors for services rendered? I would answer both questions in the negative. However hospitals may be paid for in the future, I feel that there must be no demand for any immediate financial contribution which could act as a deterrent and tend to prevent anyone from taking advantage of the hospital services that he needs. But if hospital treatment is free to all, no-one will be willing to pay for it unless he expects to receive superior amenities or greater care in treatment, as in practice he certainly will. This must necessarily imply that the services provided for those who do not pay this extra sum are not of the best. It is infinitely better, I think, to try to raise the standard for all than to provide an improved service for a favoured few, selected solely because of their relative affluence. Small wards, curtained cubicles, and a sufficiency of side wards should be capable of giving privacy to all who desire or need it.

There is one relatively small matter in which both voluntary and municipal hospitals are too often sadly lacking. It is in provision for the comfort of those visiting seriously ill relatives. A room that can be warmed, with comfortable easy chairs and couches, should be provided and provision made for a simple meal at night if necessary. It is not likely that such amenities would be often abused.

WAR

Comparing the present with the last great war, there have been two definite improvements. First, the Emergency Medical Scheme, through which all hospitals of any size, both municipal and voluntary, have had to obey the instructions of the Ministry of Health, has brought some order into our chaotic hospital system. Secondly, Service cases have been admitted to the same hospital as civilians and treated by the civilian doctors in them to a much greater extent than in the last war. This classification of patients according to the nature of their affections rather than the type of clothing that they wear is certainly a step in the right direction. But it must go further and be extended to the wards of hospitals, for every type of disease requires its own special type of nursing and treatment. It is manifestly absurd to have in the same hospital different wards for civilians, sailors, soldiers, and airmen with a few cases of the several types of disease in each. It should be easy to so assimilate the regulations governing the feeding and behaviour of each of these classes that neither becomes adversely affected by the presence of the other. All cases of allied affection could then be treated in the same wards with consequent benefit to all concerned.

In conclusion, I wish to express my thanks to Sir Allen Daley, MOH for the County of London, for much helpful advice, both in the preparation of this lecture, and also during the 10 years of administrative experience that made it possible.

BACTERIOLYTIC ACTION OF PENICILLIN

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Fleming's first observation on penicillin was the lysis of colonies of *Staphylococcus aureus* on an agar plate at the circumference of a colony of *Penicillium notatum*. It was therefore the observation of bacteriolysis which led to the discovery of penicillin.

Many interesting facts in Fleming's original (1929) article on penicillin seem to have been overlooked, and not the least interesting is his observation that staphylococci in broth cultures containing penicillin multiply during the first few hours of incubation and that the organisms are killed and lysed after this initial period of multiplication. Rantz and Kirby (1944), using photoelectric turbidimetric methods, found that the action of penicillin on staphylococci in broth could be divided into several phases. At first the staphylococci multiplied in penicillin-broth at the same rate as in plain broth; then multiplication slowed down and ceased. Finally progressive bacteriolysis was observed. Himmelweit (1944) found that young broth cultures of staphylococci are lysed by penicillin much more quickly than older cultures.

METHODS

Cultures, opaque enough for bacteriolysis to be observed, were made in tryptic digest broth; the time of incubation varying from 1 to 5 hours according to the rate of growth of the organism. Turbidity standards were prepared by adding formalin in a dilution of 1 in 100 to varying quantities of the organisms in broth made up to a total volume of 1 c.cm. A suitable dilution of penicillin in a volume of 0·1 c.cm. was added to another portion of the same culture so that the final total volume was 1 c.cm. The tubes were then incubated in a water-bath at 37° C. Any increase or decrease in turbidity of cultures was noted at short intervals by comparison with the formolised standards. Young cultures which had been stored overnight at 0° C lysed as quickly as freshly prepared cultures, and this method was often adopted because it allowed more time during the day for observation of progressive bacteriolysis.

PNEUMOCOCCUS

A 3-hour culture of *Pneumococcus* type I was mixed with 1 unit of penicillin. The turbidity of the culture increased during the first hour of incubation, it then returned to its original level, and within 2 hours progressive lysis had commenced. After 4½ hours' incubation the culture was completely lysed and a loopful of the clear fluid developed one colony when spread on a blood-agar plate previously treated with penicillinase. A control plate of the culture without penicillin developed innumerable colonies.

The same experiment with *Pneumococcus* type II gave a similar result. The opacity at first increased, progressive lysis commenced in 1½ hours and was complete in 4½ hours. A penicillinase blood-agar plate was sown with a loopful of the lysed culture after 4½ hours' incubation and it remained sterile.

Pneumococcus type III lysed more slowly. Increased turbidity persisted for 2 hours; lysis commenced in 3 hours and was complete in 6 hours.

Rapid lysis of pneumococci by penicillin is dependent on the age of the culture. A 16-hour culture of *Pneumococcus* type II was mixed with 1 unit of penicillin. During the first 10 hours of incubation there was no increase or decrease of turbidity. After 24 hours a trace of lysis was observed and this was not increased after 48 hours' incubation. The lysis was however greater

* Seconded for the duration of the war from the London County Council.

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than that of a control culture without penicillin. In a parallel experiment, done at the same time with a 4½-hour culture of the same strain, lysis was complete within 4 hours.

Active multiplication of organisms appears to favour rapid bacteriolysis by penicillin. This is again demonstrated in the following experiment. A 4½-hour culture of *Pneumococcus* type III was divided into two parts. One part was centrifuged down, washed once in saline and made up to its original volume with saline. When mixed with 1 unit of penicillin, as described in previous experiments, the broth culture at first increased in turbidity; lysis commenced in 6 hours and was complete in less than 20 hours. On the other hand, there was no multiplication in the saline suspension and the amount

TABLE I—EFFECT OF NORMAL RABBIT SERUM ON THE RATE OF GROWTH OF PNEUMOCOCCUS TYPE III AND ON THE RATE OF ITS LYSIS BY PENICILLIN

Hours of incubation	0·8 c.cm. of culture + 0·1 c.cm. of saline		0·8 c.cm. of culture + 0·1 unit pen.		0·8 c.cm. of culture + 1 unit pen.	
	+0·1 c.cm. serum	+ 0·1 c.cm. saline	+ 0·1 c.cm. serum	+ 0·1 c.cm. saline	+ 0·1 c.cm. serum	+ 0·1 c.cm. saline
0	0	0	0	0	0	0
1	1	1	1	1	+	1
2	3	2	+	1	++	1
3	4	3	++	1	+++	1
4	4	3	+++	1	++++	0
5	4	3	+++	1	++++	0
6	4	3	++++	0	++++	+
7	4	3	++++	0	++++	+
8	4	3	++++	0	++++	++
24	4	3	++++	+++	++++	++++

0 = original turbidity. 1, 2, 3, 4 = degrees of increased turbidity.
+, ++ = partial lysis. +++ = almost complete lysis.
++++ = complete lysis.
Bacteriostatic dose of penicillin for this culture, 0·016 unit per c.cm.

of lysis after 20 hours was not much greater with penicillin than in a control saline suspension.

Since lysis appears to depend on active multiplication of the organisms an experiment was done to see whether more rapid multiplication caused by the addition of normal rabbit serum would also lead to more rapid lysis. Table I shows the result of this experiment. The addition of serum to the culture greatly increased both the rate of multiplication and the rate of lysis. The serum culture containing 1 unit of penicillin lysed too rapidly for any preliminary increase in turbidity to be

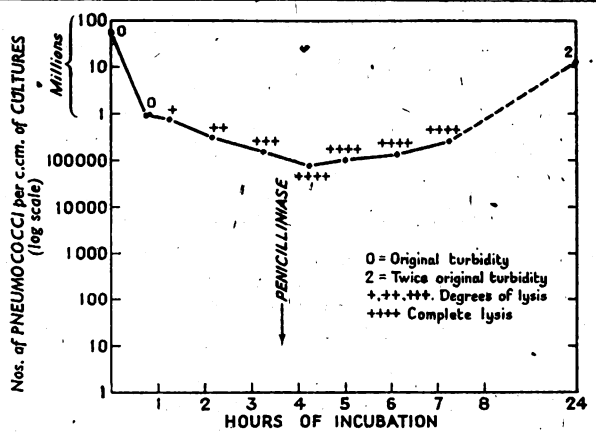

Fig. 3—Pneumococcus type III. Effect of adding penicillinase to a culture almost completely lysed by penicillin.

observed. Lysis commenced within an hour, compared with 6 hours in the corresponding culture without serum. In all the other cultures containing penicillin an increase in turbidity preceded lysis.

In order to correlate the number of living pneumococci with the opacity of the cultures undergoing multiplication or lysis, the last experiment was repeated with a 3-hour culture of *Pneumococcus* type III. The quantities of culture, penicillin, serum, and saline were the same, but the tubes containing 0·1 unit of penicillin were omitted. Suitable dilutions of the cultures were plated in poured blood-agar at intervals for colony counts. Fig. 1 gives the result of this experiment. The curves represent the increase or decrease in pneumococcal population and the turbidity is recorded at each point on the curves. The serum-culture increased in 3 hours from 20 million to 430 million organisms per c.cm.; the serum-penicillin culture was completely lysed in 3 hours, as judged by the absence of any turbidity, and the count had fallen from 20 million to 9 thousand organisms per c.cm. On the other hand, in the cultures without any serum, both multiplication and lysis were relatively slow. In 3 hours the plain broth culture increased to 80 million organisms per c.cm. and with penicillin lysis was just beginning with a count of 280 thousand organisms per c.cm. After 24 hours' incubation the counts were as follows: (1) serum-broth 144 million per c.cm.; (2) plain broth 10 million per c.cm.; (3) plain penicillin-broth sterile; (4) serum-penicillin broth sterile.

Fig. 2 gives the result of a similar experiment in which 0·5% of glucose was used to accelerate growth instead of serum. Glucose caused a similar though less pronounced acceleration of both multiplication and lysis.

It will be seen from figs. 1 and 2 that the correlation between turbidity and colony counts is imperfect. An increase in turbidity often accompanied a falling count of living pneumococci. It seems probable that multiplication, death, and lysis may all occur independently at the same time in a culture containing penicillin. The experiments show, however, that progressive lysis and ultimate sterilisation of the culture by penicillin are accelerated if conditions are supplied which normally cause accelerated multiplication.

Fig. 3 shows that neutralisation of the penicillin in a culture which is almost completely lysed stops the lytic process and allows the organisms to multiply. In this experiment 0·8 c.cm. of a 3-hour culture of *Pneumococcus* type III was mixed with 0·1 c.cm. of normal rabbit serum and 0·1 c.cm. of penicillin containing 1 unit. After

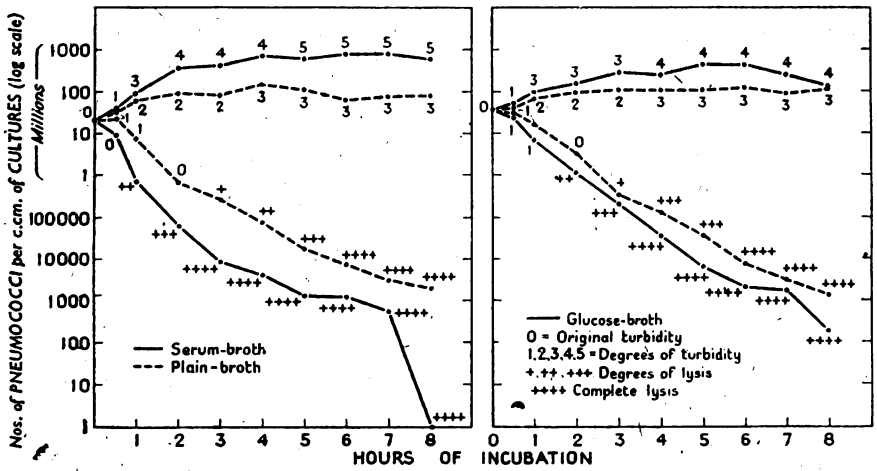

Fig. 1—Pneumococcus type III. Curves showing from above downwards: (1) Multiplication in serum-broth. (2) Multiplication in plain broth. (3) Lysis in plain penicillin-broth. (4) Lysis in penicillin-serum-broth. Concentration of penicillin 1 unit per c.cm.

Fig. 2—Pneumococcus type III. Curves showing from above downwards: (1) Multiplication in glucose-broth; (2) Multiplication in plain broth. (3) Lysis in plain penicillin-broth. (4) Lysis in penicillin-glucose-broth. Concentration of penicillin 1 unit per c.cm.

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3½ hours, when the count had fallen from 54 million to about 100 thousand organisms per c.cm. and turbidity had almost disappeared, 3 units† of penicillinase were added to the culture. Thirty-five minutes later lysis was complete, as judged by turbidity, and the culture contained 80 thousand organisms per c.cm. A slow multiplication of pneumococci then began, and during the eighth hour, although no turbidity could be detected, the count had risen to 260 thousand organisms per c.cm., After overnight incubation turbidity had risen to twice the original level with a count of only 12 million pneumococci per c.cm., presumably owing to the presence of dead and living pneumococci which had failed to lyse after the penicillin was neutralised. The continued presence of penicillin is therefore necessary for the completion of lysis and sterilisation.

STREPTOCOCCUS VIRIDANS

A young actively growing culture of *Strep. viridans* which had been incubated for 3 hours was mixed with 1 unit of penicillin in a total volume of 1 c.cm. Turbidity increased during the first hour; progressive lysis then commenced and was complete in 3 hours.

A second strain of *Strep. viridans* which was more resistant to lysis by penicillin was treated in the same way with 1 unit of penicillin; an additional tube of the culture was tested containing 1 unit of penicillin and 10% normal rabbit serum to accelerate lysis. The culture without serum showed increased turbidity during the first 3 hours and after 24 hours it had lysed to about half the original turbidity. The serum-culture increased in turbidity for 1½ hours; lysis then commenced and was complete in 24 hours.

A third strain of *Strep. viridans* which was still more resistant to lysis by penicillin was treated in the same way. The culture without serum showed increased turbidity for 7 hours and after 24 hours it had returned to its original turbidity. The serum-culture at first increased in turbidity; lysis commenced after 3½ hours and the culture was about half lysed after 24 hours' incubation.

HÆMOLYTIC STREPTOCOCCI

Lysis of hæmolytic streptococci by penicillin was not obtained with any of the numerous strains tested unless serum was added to the actively growing young cultures at the same time as the penicillin. Three-hour cultures of three different strains of group A hæmolytic streptococci were mixed with 100, 10, 1, and 0·1 units of penicillin and 10% normal rabbit serum. After 19 hours' incubation one strain showed definite partial lysis and one showed doubtful lysis. After incubation for another 24 hours all the strains showed definite partial lysis. There appeared to be little difference in the degrees of lysis caused by the different doses of penicillin.

Hæmolytic streptococci of groups C (human origin) and G also underwent partial slow lysis by penicillin in serum-broth. One of the group C strains was completely lysed on the sixth day.

STAPHYLOCOCCUS

Young cultures of staphylococci in the stage of active multiplication are rapidly lysed by penicillin. With older cultures, which have been incubated for 16 or 24 hours before adding the penicillin, lysis is much slower and may not be complete until incubation has been continued for 3 or 4 days.

As shown by Fleming (1929), staphylococci multiply in the presence of penicillin before the commencement of lysis. As in the case of pneumococci rapid initial multiplication is followed by an increased rate of lysis. This is demonstrated in fig. 4, which records the turbidity and lysis of a 3-hour culture of staphylococci treated with different doses of penicillin. The bacteriostatic dose of penicillin for this strain is 0·06 unit per c.cm. When 0·025 unit of penicillin was added to the culture, in a total volume of 1 c.cm., rapid multiplication was followed by rapid lysis, which did not however proceed

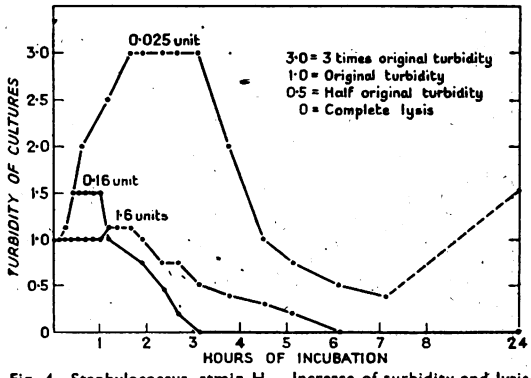

Fig. 4—Staphylococcus, strain H. Increase of turbidity and lysis with various concentrations of penicillin. Bacteriostatic dose of penicillin for this strain = 0·06 unit per c.cm.

to completion and was followed by a second period of multiplication. With 0·16 unit of penicillin a short period of rapid multiplication was followed by the most rapid lysis, which was complete in 3 hours. With a ten-fold increase in the dose of penicillin to 1·6 units per c.cm. multiplication was delayed and much less pronounced, while the subsequent lysis was not complete until the culture had been incubated for 6 hours. This seems to show that staphylococci conform to the general rule that the rate of lysis by penicillin depends on the actual or potential rate of multiplication of the organisms.

This is demonstrated in table II, which shows the times of lysis of young cultures of two strains of staphylococcus. The strain H did not increase in turbidity with 100, 10, or 1 units of penicillin, and with all these doses lysis occurred at the same rate. With 0·1 unit of penicillin

† One unit of penicillinase being the quantity required to neutralise one unit of penicillin when titrated for bacteriostasis of staphylococcus H on a 20% range of dilutions.

TABLE II—MULTIPLICATION AND LYSIS OF TWO STRAINS OF STAPHYLOCOCCUS WITH VARIOUS DOSES OF PENICILLIN

Hours of incubation	Strain H					Strain K 1				
	Units of penicillin per c.cm.					Units of penicillin per c.cm.				
	100	10	1·0	0·1	0·01	100	10	1·0	0·1	0·01
0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	1	1	0	1	1	1	1
2	0	0	0	+	1	1	1	1	1	1
3	0	0	0	++	1	1	1	0	1	1
4	+	+	+	+++	1	±	+	+	0	1
5	++	++	++	++++	1	++	++	+++	++	1
6	++	++	++	++++	1	++++	++++	++++	++++	1
7	++	++	++	++++	1	++++	++++	++++	++++	1
8	++	++	++	++++	1	++++	++++	++++	++++	1
24	++++	++++	++++	++++	1	++++	++++	++++	++++	1

0 = original turbidity. 1 = increased turbidity. ±, +; ++ = degrees of lysis. +++ = almost complete lysis.
++++ = complete lysis. Bacteriostatic doses of penicillin for strain H, 0·06 unit per c.cm.; for strain K 1, 0·06 unit per c.cm.

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TABLE III

MULTIPLICATION AND LYSIS OF STAPHYLOCOCCUS STRAIN H WITH VARIOUS DOSES OF PENICILLIN IN BROTH AND IN SALINE

Hours of incubation	Washed cocci in broth						Washed cocci in saline						
	Units of penicillin per c.cm						Units of penicillin per c.cm.						
	1·0	0·5	0·2	0·1	0·05	0·02	1·0	0·5	0·2	0·1	0·05	0·02	Nil
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	2	3	4	5	6	7	0	0	0	0	0	0	0
2	1	1	1	1	3	4	0	0	0	0	0	0	0
3	1	1	0	+	2	3	0	0	0	0	0	0	0
4	0	0	++	++++	0	3	0	0	0	0	0	0	0
5	0	+	++++	++++	+	2	0	0	0	0	0	0	0
6	+	++	++++	++++	++	2	0	0	0	0	0	0	0
7	+++	+++	++++	++++	+++	2	0	0	0	0	0	0	0
24	++++	++++	++++	++++	1	1	++	++	++	++	++	++	++

0 = original turbidity. 1, 2, 3 &c. = degrees of increased turbidity. +, ++, +++ = degrees of lysis. ++++ = complete lysis.

initial multiplication was followed by more rapid lysis. On the other hand, strain K 1 multiplied in all the dilutions of penicillin and there was comparatively little difference in the rate of lysis by the various doses of penicillin.

The small optimal lytic dose noted for strain H (table II) has also been noted with some other strains of staphylococci. Among four coagulase-positive and two coagulase-negative strains tested, three lysed first with small doses and three with large doses, there being one coagulase-negative strain in each group.

Table III shows the effect of various doses of penicillin on a 3-hour culture of staphylococcus H which was divided into two parts, washed once in saline and resuspended (*a*) in broth, (*b*) in saline. In this experiment multiplication in broth occurred with all the doses of penicillin including 1 unit. The most rapid multiplication and lysis were observed in the tube containing the smallest dose of penicillin, which was greater than the bacteriostatic dose. When the cocci were suspended in saline there was no multiplication and no lysis apart from the lysis which always occurs when young staphylococci are incubated in saline.

It is evident that rapid multiplication favours rapid lysis by penicillin, and the following experiment shows that staphylococci in the resting state can survive in large doses of penicillin.

A 24-hour culture of the strain H in 8–10 c.cm. of broth was mixed with 100 units of penicillin in 1 c.cm. of saline. After 6 days' incubation one loopful was subcultured into fresh broth and the subculture was again treated with 100 units of penicillin. This process was repeated five times and at the end of the experiment the treated staphylococci were no more resistant to bacteriostasis or lysis by penicillin than the original strain. It was found that after 8 days' incubation the culture still contained about 6 units per c.cm. of penicillin. The resting organisms had therefore been exposed to penicillin for 6 days on five separate occasions without sterilisation.

In a similar experiment with 1000 units of penicillin and a 24-hour culture of staphylococcus strain A it was found that the resting staphylococci survived and grew out when subcultured into broth containing penicillinase. Old cultures of pneumococci which are not actively dividing also survive in large doses of penicillin.

CLOSTRIDIUM WELCHII

Two strains of *Clostridium welchii*, S 107 and A 118, were tested for lysis by penicillin. Overnight cultures growing actively in Robertson's meat medium were subcultured into digest broth without meat, which was boiled and cooled to 37° C immediately before sowing. After 1½ hours' incubation the cultures, which were then actively multiplying and forming gas, were mixed with 100, 10, and 1 units of penicillin as previously described for aerobic organisms. Table IV shows that initial multiplication was followed by lysis which was almost complete with the larger doses of penicillin after 22 hours. A considerable increase in the rate of multiplication occurred when 0·5% glucose or 10% normal serum was added to the cultures, and under these conditions 10 units of penicillin caused complete lysis in less than 17 hours.

When sodium thioglycolate was used to produce anaerobiosis, and when the tubes were sealed with soft paraffin to exclude air, an increased rate of multiplication was accompanied by much more rapid lysis. With 10 units of penicillin per c.cm. a 2-hour culture of strain A 118 was completely lysed in 1 hour when 10% of serum and 1% of glucose were added to the culture; with 10% serum alone lysis was complete in 1½ hours and with 1% glucose alone in 2 hours. Similarly with 1 unit of penicillin per c.cm. the serum-glucose culture was completely lysed in 3 hours; the serum-culture was almost completely lysed in 6 hours and the glucose-culture was half lysed in 6 hours. Without any penicillin the upward displacement of soft paraffin seals by gas formation in 2 hours was as follows: (1) serum-glucose culture 15 mm.; (2) serum-culture 6 mm.; (3) glucose-culture 3 mm. The rate of lysis therefore ran parallel with the rate of gas formation.

TABLE IV—MULTIPLICATION AND LYSIS OF TWO STRAINS OF *Cl. welchii* WITH VARIOUS DOSES OF PENICILLIN

Hours of incubation	Strain S 107				Strain A 118			
	Units of penicillin per c.cm.				Units of penicillin per c.cm.			
	100	10	1	Nil	100	10	1	Nil
0	0	0	0	0	0	0	0	0
1	1	1	2	3	1	1	2	2
2	1	1	3	4	1	1	2	3
3	+	0	2	4	+	0	2	4
4	++	+	2	4	+	+	2	4
5	+++	+	2	4	+	+	2	4
22	+++	+++	1	4	+++	+++	++	4

0 = original turbidity. 1, 2, 3 &c. = degrees of increased turbidity. +, ++ = degrees of lysis. +++ = almost complete lysis.

DISCUSSION

All the penicillin-sensitive organisms tested were susceptible to bacteriolysis by penicillin. On the other hand penicillin-insensitive organisms such as *Bacillus coli* and *Ps. pyocyanea* were not lysed by penicillin. The question arises whether the bacteriostatic action of penicillin is distinct and separate from the bacteriolytic action or whether they are different manifestations of one and the same process. There can be no doubt

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that penicillin is capable of killing micro-organisms without lysis, and it seems probable that multiplication, death, and lysis may all occur independently at the same time in a culture containing penicillin. This is shown in fig. 2 where, during the first 2 hours of incubation, turbidity increased with a diminishing colony count, presumably owing to rapid multiplication accompanied by a still more rapid death-rate but without correspondingly rapid lysis. After this initial period progressive lysis and a steadily falling colony count proceeded to complete lysis and complete sterilisation.

When the potential rate of multiplication is increased by the addition of serum, as shown in table I and fig. 1, bacteriolysis begins within an hour without any preliminary increase of turbidity or other evidence of multiplication. It is however possible that in this case multiplication is not detectable because both the death-rate and the rate of lysis exceed the rate of multiplication.

Whether this is the correct explanation or not it seems to be a general rule that the rate of bacteriolysis by penicillin depends on the actual or potential rate of multiplication of the organisms. Hobby, Meyer, and Chaffee (1942) showed that multiplication of organisms is necessary for the action of penicillin. Bigger (1944) found that staphylococci which are not actively dividing survive in penicillin while the actively multiplying organisms are killed. This is confirmed by experiments quoted in this paper. It would appear that bacteriostasis, bactericidal action, and bacteriolysis may be different stages of a single process proceeding in that order. Undoubtedly bacteriolysis is one method by which penicillin can sterilise a culture, but it is not necessarily the only method. There is at present no evidence whether one or more factors are involved in the bacteriostatic, bactericidal, and bacteriolytic effects of penicillin since the method of its action is unknown.

It is interesting to note (see table III and fig. 4) that a dose of penicillin which is considerably smaller than the amount required to produce bacteriostasis in the usual laboratory tests has a definite bacteriolytic action on staphylococci. This sequence of multiplication, lysis, and renewed multiplication in very dilute penicillin can also be demonstrated with pneumococci. If the same thing occurs in the human body, where unrestricted multiplication is prevented, bacteriolysis will continue after the blood level of penicillin has fallen below the amount required to produce bacteriostasis in ordinary laboratory tests.

It may be that the real reason why penicillin is so effective is the fact that young cultures in the stage of active multiplication are more susceptible to the bacteriolytic action of penicillin than older cultures. Todd (1927) and Hare (1931) showed that old cultures are killed or phagocyted by normal human blood, whereas young cultures are highly resistant to these normal mechanisms of blood clearance.

It is therefore fortunate that the organisms which are in such a state that they could readily invade the human body are in just the state when they are most susceptible to the bacteriolytic action of penicillin.

SUMMARY

Bacteriolysis by penicillin is dependent on the phase of growth of the organisms.

Bacteriolysis by penicillin has been observed with all the penicillin-sensitive organisms tested—*Pneumococcus* types I, II and III, *Strep. viridans*, hæmolytic streptococcus groups A, C, and G, staphylococcus, and *Cl. welchii*.

The most rapid lysis occurs with organisms at the maximal rate of multiplication.

This may be the real reason why penicillin is so effective in treatment.

I wish to thank Sir Alexander Fleming for his interest and assistance.

REFERENCES

Bigger, J. W. (1944) *Lancet*, ii, 497.
Fleming, A. (1929) *Brit. J. exp. Path.* **10**, 1.
Hare, R. (1931) *Ibid*, **12**, 261.
Himmelweit, F. (1944) Personal communication.
Hobby, G. L., Meyer, K., Chaffee, E. (1942) *Proc. Soc. exp. Biol., NY*, **50**, 281.
Rantz, L. A., Kirby, W. M. M. (1944) *J. Immunol.* **48**, 335.
Todd, E. W. (1927) *Brit. J. exp. Path.* **8**, 289.

PNEUMOCOCCAL LOBAR PNEUMONIA TREATED WITH SULPHAMEZATHINE

A FURTHER STUDY

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THIS paper gives some further account of an investigation of which a first report was published 2 years ago (Macartney et al. 1942). An additional series of 287 cases of pneumococcal lobar pneumonia have been treated with 'Sulphamezathine' (formerly known as 'Sulphamethazine'), a heterocyclic sulphonamide compound closely allied to sulphadiazine, remarkable alike for its high water-solubility and its relative freedom from toxicity.

To this second series of cases the same diagnostic criteria were applied as formerly, namely: (1) a typical pneumonic history; (2) physical and X-ray signs of lung consolidation; (3) the isolation and where possible typing of a pneumococcus from the sputum. Blood was also taken for culture on the day of admission, and the procedure repeated when necessary. The usual dosage employed was 4 grammes, initially followed by 2 g. every 6 hours, a scheme which was found to be generally effective in maintaining an adequate blood-concentration and in bringing about a rapid improvement in the patient's condition. Nevertheless, when a patient was in poor condition it was deemed wise to give the drug every four hours for the first 24 hours to ensure a satisfactory blood-level. When there was a poor clinical response to the drug the sulphonamide blood-concentration was estimated and if it was below 5 mg. per 100 c.cm., the sodium salt was usually given intramuscularly until the clinical condition improved.

Many of the patients had been given sulphapyridine before admission to hospital, usually in so small doses as to have little effect on the course of the disease. Confusion would arise in these cases when the patient vomited during the first 24 hours after admission, but almost invariably this symptom disappeared without our discontinuing the treatment, indicating that sulphapyridine was the probable cause of the emesis.

Since our favourable preliminary report on sulphamezathine other papers describing its use in pneumonia have appeared. Peters and Easby (1943) found a case-fatality of just over 4% in 77 cases of pneumonia in adults and children. Morgan and Wylie-Smith (1943) made a comparative study of sulphapyridine, sulphadiazine and sulphamezathine in the treatment of lobar pneumonia. They confirmed the efficiency of sulphamezathine and its relative freedom from harmful side-effects; it was used in 68 cases without a death. Melton in 1944 had a case-fatality of 6·7% in 134 cases of lobar pneumonia and a rate of 11·1% in 179 cases of a sulphapyridine series; ill effects were slight though there was occasional leucopenia. Jennings and Patterson (1942) reported that the drug was well tolerated and effective in children.

The efficiency of the drug in curing pneumonia thus appears unquestionable and the rareness of toxic reactions has been confirmed by all who have published their results. Our cases comprised 200 males and 87 females. There were 24 deaths, giving a case-fatality of 8·4%. All deaths occurring within 24 hours of admission to hospital have been excluded as tending to obscure a true estimation of the value of the drug. Even so, the death-rate is slightly higher than in our first series (6·7% of 71 cases) though it cannot be considered unsatisfactory when the age-groups in table I are studied. It is then seen that of 24 deaths, 23 are in the 40-plus groups, and of these, 22 are in patients over 50. The unusually high proportion of patients in these later decades is almost certainly responsible for the slightly higher total mortality than in our first series and in the other series quoted (see table II). The average age of all patients on admission to hospital is at

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TABLE I—RELATION OF AGE TO CASE-FATALITY

Age-group (yr.)	Cases	Deaths	Per cent.
16–39	123	1	0·8
40–49	61	1	1·7
50–59	45	9	20
60–69	48	10	20
over 70	10	3	30

present higher than formerly on account of home nursing difficulties, and many elderly patients are admitted desperately ill for lack of necessary attention.

In cases which do not respond quickly to the drug the value of estimating the sulphonamide blood concentration has been repeatedly proved. Fairly often, through failure in absorption or for other reasons, the blood-level was found to be low but was quickly corrected by the intramuscular injection of the sodium salt. It

TABLE II—COMPARISON OF AGE-INCIDENCE WITH OTHER REPORTS

—	Under 40 yr.	Deaths	Per cent.	Over 40 yr.	Deaths	Per cent.
Don et al.: Sulphapyridine ..	70	2	2·9	49	6	12·2
Macartney et al: Sulphamezathine ..	37	1	2·7	36	4	11·1
Morgan and Wylie-Smith: Mixed series	281	8	2·8	210	38	18·1
Present series	123	1	0·8	164	23	14·0

may be added, that during the recent influenza epidemic patients who were desperately ill when admitted were restored to comparative ease in a few hours by an immediate intravenous injection of 3 g. of the drug; the effect was impressive.

Owing to the difficulty in obtaining supplies of sera, pneumococcus typing could not be continued throughout

TABLE III—INCIDENCE OF PNEUMOCOCCUS TYPES

Type	No.	Type	No.	Type	No.	Type	No.
1	76 (26)	6	1	13	1	23	2
2	19 (3)	7	4	14	1	25	1
3	18 (3)	8	5	15	1	..	..
4	2 (1)	10	1	18	1	..	..
5	12 (7)	11	1	22	1	..	..

the investigation; but the result of 147 typings given in table II shows that, as in our previous observations, type 1 infection is still by far the commonest. It is interesting to note that in Glasgow type 2 infections are much more common than type 1 (Anderson 1944). A positive blood-culture was obtained in 44 patients (15·3%), of whom 9 died, a proportion which compares

TABLE IV—INCIDENCE OF COMPLICATIONS

	No.	Per cent.		No.	Per cent.
Serous effusion	11	3·8	Endocarditis ..	3	1·0
Empyema ..	3	1·0	Lung abscess ..	2	0·7
Pericarditis ..	4	1·4	Jaundice ..	2	0·7

favourably with our sulphapyridine incidence (Don et al. 1940) of 4 deaths in 16 bacteræmic cases. Generally speaking, these patients are severely infected, so it is advisable to boost the blood-level of the drug by parenteral administration, a measure which generally gave good results. The bacteræmic cases are included in table III.

Complications.—The incidence of complications in this series was remarkably low judged by clinical, radiological and post-mortem examinations. It is possible that a few serous effusions were missed owing to extensive underlying consolidation, but the figure is substantially correct for effusions giving rise to well-marked clinical and radiological signs. The significance of some of the complications in causing death is discussed later.

Toxicity.—Our experience with our first series in regard to toxicity is again borne out. A rash appeared on 6 patients; 7 complained of nausea and 11 vomited; there were 2 cases of drug fever and 2 of leucopenia. In no case did vomiting cause cessation of treatment. Both cases of leucopenia recovered quickly when the drug was discontinued. There were no renal complications and no cyanosis. There is thus ample proof that this drug is one of the least harmful of the sulphonamides and is well tolerated.

FATAL CASES

The efficiency of sulphonamide treatment in pneumococcal lobar pneumonia is such that special attention must be paid to the failures, in order to assess the factors which prevent recovery, more than one factor often being present. The deaths in the present series are 24, while in our previous series of 71 cases there were 5 deaths. It is convenient to study them together: they seem to fall into 6 groups.

1. *Inadequate drug concentration in the blood.*—This seems to have been the cause of death in 5 patients, and the following case illustrates the group:

CASE 1.—A man of 57, subject to chronic bronchitis, had a severe type 5 pneumonia affecting the whole of the left lung. Admitted on the 10th day, he died on the 14th, and during this time had 44 g. of sulphamezathine by mouth. Blood-levels on the 10th and 12th days were 1·1 and 3·9 mg. per 100 c.cm.; 3 g. of the drug was given intramuscularly on the 13th day, and the blood-level raised to 5·3 mg. per 100 c.cm., but this measure was both inadequate and too late.

The question whether the patient is actually maintaining an effective concentration of the drug needs careful consideration in every case. As a rule 24 hours must elapse before one can be reasonably sure of a satisfactory response to treatment, and the loss of this time may make all the difference to the final result. Whether low blood-levels are due to faulty absorption or excessive acetylation is not easy to prove in these critical cases, but it is certainly true that a low blood-level is usually accompanied by a relatively high concentration in the acetylated inactive form. Parenteral treatment is easy and safe, with due precautions, and is necessary in a definite proportion of cases. In the light of our experience, we feel that the drug should be given by injection as well as by mouth during the first 24 hours in all severely toxic cases and in all cases seen after the 7th day of disease, and that a blood estimation of the drug should be made daily until the clinical condition is clearly satisfactory. In addition, the amount of the drug in the blood should be estimated in any case which fails to show decided clinical improvement after 36 hours' treatment by mouth.

2. *Late heart-failure.*—Three patients died of myocardial failure more than 2 weeks after the pneumonic toxæmia had been overcome and the lung was resolving well. Two were men over 65, each with a severe infection and positive blood-culture, who nevertheless responded well to treatment. It seems advisable for elderly people with pneumonia to convalesce slowly, and for special attention to be given to the state of the heart.

3. *Pneumococcal endocarditis.*—Of the 24 deaths, 4 were due to pneumococcal endocarditis. For some years we have been impressed with the frequency and importance of this condition as a cause of death in pneumonia, and a clinical and pathological analysis of 20 cases was made recently by two of us (Luxton and Smith 1943). The clinical diagnosis is far from easy unless the possibility of endocarditis is borne in mind when pyrexia persists, even if other complications such as empyema or pericarditis are found. Petechiæ are few and usually terminal, the spleen is palpable in only 10%, and the cardiac signs may be very difficult to assess. Unless autopsy is performed in every fatal case of pneumonia, the true incidence and importance of pneumococcal endocarditis as a cause of death will continue to be underestimated.

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It is not clear at what point in the course of acute pneumonia the endocardium becomes infected. In some it is probably early, in which case sulphonamide therapy would probably act as usual on the pneumonic process but would fail to check the developing threat to the endocardium. In others infection of the endocardium may have resulted from an empyema which acted as a reservoir for virulent pneumococci which were carried via the pulmonary veins to the left heart. The following is a typical case in this series.

CASE 2.—A man of 56 had acute pneumonia and was treated at home with sulphapyridine. A week before admission he had a rigor. When first seen, he had a right-sided empyema containing type 1 pneumococcal pus, with a positive blood-culture. His blood-pressure was then 115/70 mm. Hg. A week later an aortic diastolic bruit became audible, and the blood-pressure was 120/55 mm. Hg. The spleen was never palpable, and not until 4 days before death were petechiæ discovered, on the conjunctivæ only. Although there were no clinical signs of meningitis, the cerebrospinal fluid taken a week before death, though sterile, contained 225 polymorphonuclear cells per c.mm. Blood-culture was positive on 3 out of 4 occasions. Sulphamezathine, totalling 128 g., was given by mouth over 14 days, and a toxic rash developed 2 days before death. Autopsy revealed typical vegetations of pneumococcal endocarditis on the aortic cusps.

4. *Chronic bronchitis and bronchiectasis.*—These conditions are generally recognised as of serious prognostic importance in pneumonia. Of our 24 deaths, 13 were in patients described as "chronic bronchitic." Apart from the structural damage to the heart, lungs and respiratory mechanism resulting from chronic bronchitis, mixed infection is common. One such patient in this series had a type 2 pneumococcus, a Friedlander's bacillus and a *Staph. aureus* (coagulase-positive) in the lung, which was in a state of gangrene. Most of such patients were over 50 years of age, but the following illustrates the serious results of pneumonia complicating bronchiectasis in a man of 29.

CASE 3.—The patient was admitted on the 16th day of a pneumonic illness, and a radiogram showed an abscess in the left lower lobe. Great general improvement resulted from treatment with sulphamezathine by mouth and parenterally, high blood-levels being attained; 26 days after admission there was serious recurrence of infection in the right upper lobe. Autopsy revealed bilateral bronchiectasis in the lower lobes, interlobar empyema, and a typical recent pneumonia in the right upper lobe.

5. *Pneumonia complicated by chronic disease elsewhere.*—In 2 cases *chronic nephritis* was found clinically and at autopsy. Both had a severe type 1 infection, which responded well to sulphamezathine, but they died from uræmia, blood-urea levels being 211 and 163 mg. per 100 c.cm., shortly before death.

A man of 44 whose pneumonia responded well to sulphamezathine was found at autopsy to have a coarse portal cirrhosis and enlarged spleen.

6. *Pneumococcal toxæmia.*—Nine deaths were attributed to the direct effect of toxæmia, usually ending in peripheral circulatory failure. Six were men, three were women, all between the ages of 52 and 80, the average age being 68. Three had type 1 infection, three type 3, and one type 5. In four the blood-culture was positive. The actual extent of lung involvement seems significant, two lobes being involved in five of the cases. Satisfactory drug levels in the blood were attained in all, high levels (14–24 mg. per 100 c.cm.) being achieved in three, one of whom developed a toxic rash. Only three were admitted to hospital before the 7th day of disease, and the average day of death was the 14th, the limits being the 7th to the 21st. The delay in treatment seems therefore to be a significant factor. Autopsy was obtained in 5 cases, all showing grey hepatisation, and 2 had a breakdown of lung tissue with an acute abscess of the lung. It is certain that toxæmia from the pneumonia alone will cause death in spite of the maintenance of a high sulphonamide level in the blood, and this is especially true in the older patient. Abdominal symptoms, as a sign of toxæmia, may be of particular significance in acute pneumonia, as illustrated by 5 cases in this group. Tympanites is usually terminal, but may occur early in the disease. Hiccough is important as a toxic sign, quite apart from its seriousness as a symptom. In one case true paralytic ileus appears to have been the chief cause of death.

CASE 4.—A man of 52, admitted on the 8th day in a state of delirium and semiconsciousness, with type 5, pneumonia affecting the right lower lobe. He had had hiccough for 2 days. Sulphamezathine by mouth and parenterally produced striking improvement in 24 hours, but 3 days later constipation and tympanites developed and failed to respond to treatment. Grey hepatisation was found at autopsy, and paralytic ileus with flakes of fibrinous material on the intestinal wall.

SUMMARY AND CONCLUSIONS

Sulphamezathine has been used in the treatment of a further 287 cases of pneumococcal lobar pneumonia with a case-fatality of 8·4%.

Of the 24 patients who died, 23 were over 40, and of these 22 were over 50 years of age.

It is confirmed that the drug is relatively non-toxic, and that the number of complications is not high.

An analysis of the deaths in this and the previous series leads us to suggest the following points as an aid in reducing still further the mortality of lobar pneumonia.

Steps must be taken to ensure an adequate drug concentration in the blood in the first 24 hours in severely toxic cases and in those coming for treatment after the 7th day of the disease.

In older patients the heart condition should be assessed and adequate convalescence allowed.

Abdominal symptoms should be regarded as a sign of toxæmia and receive early treatment.

An undetected empyema may be one of the reasons for the development of pneumococcal endocarditis.

REFERENCES

Don, C. S. D., Luxton, R. W., Donald, H. R., Ramsay, W. A., Macartney, D. W., Smith, G. S., Adderley, C. H. (1940) *Lancet*, i, 311.
Jennings, P. A., Patterson, W. H. (1942) *Ibid*, ii, 308.
Luxton, R. W., Smith, G. S. (1943) *Quart. J. Med.* 45, 61.
Macartney, D. W., Smith, G. S., Luxton, R. W., Ramsay, W. A., Goldman, J. (1942) *Lancet*, i, 639.
Melton, G. (1944) *Ibid*, i, 277.
Morgan, T. N., Wylie-Smith, R. (1943), *Ibid*, ii, 731.
Peters, B. A., Easby, M. L. (1943), *Brit. med. J.* ii, 230.
Anderson (1944) (personal communication).

SPREAD OF INFECTIVE HEPATITIS *

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THIS paper is based on an epidemiological study of infective hepatitis among New Zealand soldiers at Alamein in 1942.

OBSERVATIONS

In 1942 the 2nd New Zealand Division was together as a single unit in Syria and in the Western Desert until July 22. It had the normal incidence of jaundice among all units. From that date it was divided into three separate groups and the incidence of jaundice changed.

Group I.—Two brigades of front-line troops, stationed in the desert at Alamein. Involved in the epidemic.

Group II.—Medical, supply, and maintenance units stationed in the desert 10 miles to the rear. Not involved.

Group III.—One brigade of infantry which returned to base. Not involved.

For epidemiological studies the desert has the advantage that there is no additional population; many factors remain constant and equal among all troops in all areas. Group I were front-line units which went into the New Zealand box at Alamein at the end of July: 35–40 days later hepatitis broke out among them, and it lasted until 35–40 days after their withdrawal from the area; among 7500 men there were 1059 cases. Group II units were located 10 miles to the rear of the Alamein line, and among 3900 men there were only 78 cases.

The New Zealand box was at the southern extremity of the Alamein line. The rest of the line north to the sea was occupied by British and Indian troops who were not affected until later in the season but then had a severe epidemic. The epidemic was thus localised in an

* A paper containing these data was presented by the author at the 2nd MEF Medical Conference held at Cairo in 1943; and the epidemic is also analysed in a thesis presented for the degree of MD in the University of New Zealand.

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area 5 miles square at the south of the Alamein line—a piece of barren desert, with no scrub or water or any natural feature to distinguish it from the rest of the Western Desert. As all units separated from the New Zealand Division on July 22 escaped the epidemic it was clear that the infection was introduced in this area.

At that time the one difference between the New Zealand site and the rest of the Alamein line was that it was recaptured ground. It had been occupied by Italians and Germans, and then fought over at the battle of Ruwyeisat Ridge, before being occupied by New Zealand troops; whereas the rest of the line, except in one case to be mentioned later, had been occupied and held by the British units then in possession. Within the area itself the incidence of hepatitis was greatest in the extreme south and least in the north.

INTERPRETATION

As the various possibilities were considered one was able to eliminate such factors as water, food, hardship, living conditions, and climate, these being similar among all units in the line. During previous years New Zealand soldiers had shown no special susceptibility to the infection; and any predisposing factors which may have altered susceptibility during the stay in Syria were shared by the units detached in July, which remained uninfected. It was noted that reinforcements and rested troops were involved equally with the rest.

It seemed unlikely that some unknown vector was responsible, for no insects other than flies could be recognised in this or any other area. Against spread by droplet were the following facts:

1. There was no special incidence of catarrhal infections.
2. The men of infected units lived in groups of three or four in the open and had little intercommunication.
3. Small individual groups did not show any special tendency to infect each other.
4. Field ambulances which ultimately handled all cases as they went to the rear areas had a very low incidence.
5. Visitors to the area were frequent and did not carry the infection back to their messes and units.
6. Congestion was much less in the front line, and there were no messes or tents; whereas 10 miles to the rear men lived in tents and ate in messes and yet had no epidemic.

Clearly the site was the key, and the New Zealand box contained the reservoir of infection. There must be a mode of spread by which the virus caused cases simultaneously among many small groups scattered through the area. As flies were prevalent in incredible numbers everywhere along the Alamein line and to a lesser extent to the rear, and as diarrhœa and dysentery were rife, flies were considered the most likely vectors. The reservoir of infection could only be in the affected area; and this differed, as we have seen, from all other parts of the line (except that occupied by the 9th Australian Division) in that it was recaptured ground, fought over and heavily and openly contaminated by enemy fæces and dead bodies inadequately buried. We knew from patrols and prisoners that for some time there had been an epidemic of hepatitis among enemy troops opposite the New Zealand box and that many jaundiced men were kept in the front line. In the area occupied by the Australians similar conditions existed and they had a considerable number of cases at the same time as we did.

It was therefore suggested that the infection was conveyed by flies, from bodies and fæces on the infected ground, to men who were unable to protect their food, mess-tins, mouths, or hands from the hordes which swarmed over everything. Once the epidemic was established the area was reinfected by the New Zealand troops themselves; for it was never possible to achieve very satisfactory sanitation. The unit which occupied the area after the New Zealand brigades were withdrawn had an epidemic at the end of the incubation period.

Reasons why the infection did not at the time involve units north were:

1. Indian troops, who (like the Maoris) possess a partial immunity, were between the New Zealand Division and British units to the north.
2. The prevailing wind was from north-west to south-east; so flies infected in the heavily contaminated Ruwyeisat Ridge area tended to travel south.

CONCLUSION

The observations here recorded made it evident that at Alamein in September–November, 1942, infective hepatitis was spread by flies carrying the infection from human excreta. From this it was concluded that the virus must be passed in the urine or fæces or both, and that epidemics in soldiers could be prevented by adequate sanitation. This conclusion was supported by the further observation that the disease does not spread in base hospitals, prisoners-of-war cages, or anywhere where sanitation is good and there is satisfactory control of flies.

I wish to thank the many officers and men of the 2 NZ Division who assisted me in collecting data, and the DMS, 2 NZEF, for permission to publish this paper.

SIGNIFICANCE OF MITES AND THEIR EGGS IN HUMAN FÆCES

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INVASION of the alimentary canal, and urinary and respiratory tracts, by tyroglyphid (and sometimes also tarsonemid) mites has been held responsible for enteritis, nocturnal enuresis, hæmaturia, and bronchitis. In the case of the alimentary canal the evidence up to 1929 has been reviewed by A. Hase.

Mites occur in foodstuffs of all kinds, but with the exception of the well-known "Altenburger" cheese, which is riddled with these acarines, their presence in these situations is both vicarious and unintentional. The most common in foodstuffs and fæces are cheese mites (*Tyroglyphus siro* and *T. longior*), next the meal mite (*Aleurobius farinæ*), and lastly the house mite *Glycophagus domesticus*, which is also often found in fruit and meat. But evidence of pathogenicity is by no means so clear. While some have thought that actual ingestion of myriads of these small creatures may cause intestinal disturbance by mechanical irritation or by the toxins they may produce, others consider that they are entirely harmless. Originally Küchenmeister and Zürn (1881) reported intestinal upsets after ingestion of "mite cheese," and Gedoelst (1911) held that *A. farinæ* produced intestinal catarrh and cutaneous eruptions, but Reh (1925) thought that large numbers of cheese mites could be eaten without harm. Others (Böhm 1920, Moniez 1894, Reye 1919, Martini 1925) agreed. Kunze (1924) and Hieronymi (1925) fed *A. farinæ* to a dog for four weeks without effect. Graf Vitzthum (1925) thought that various allergic cutaneous manifestations might eventuate, depending on the sensitivity of the individual.

Mites may be real, though rare, ectoparasites or their presence may be purely accidental. Thus Khalil (1921) reported finding the eggs of mites (*A. farinæ*) in the fæces of 8% of 130 Cornish miners and the adult insects were swarming in buckets of excrement brought up from the mines. Endoparasitism of the urinary tract was reported by J. Mackenzie (1922) who found *A. farinæ* and *Tarsonemus* in recruits with nocturnal enuresis and in one case of hæmaturia. Carter and his colleagues (1944), in investigating cases of bronchitis and asthma in Ceylon, have found many species of dead mites in the sputum, and their suggestion that they might fulfil some pathological rôle in this situation has drawn fresh attention to this subject.

The genus tyroglyphus includes the well-known cheese and sugar mites, and Hirst (1920) stated that persons whose work brings them into contact with material infested with these living creatures are apt to suffer from forms of dermatitis known as "grocer's" or "copra" itch (see also Patton and Evans 1931). The females of *Aleurobius farinæ* and *Tyroglyphus siro* are not easy to differentiate. The male of the former has a thick first pair of legs with a large tooth-like projection from the inside of the femur. The body hairs are simple; none are pectinated and none are as long as the body. In *T. siro* in the female the vulva is placed on a slight heart-shaped elevation and the tarsi are shorter than, or equal to, the third and fourth joints added together (Michael 1903).

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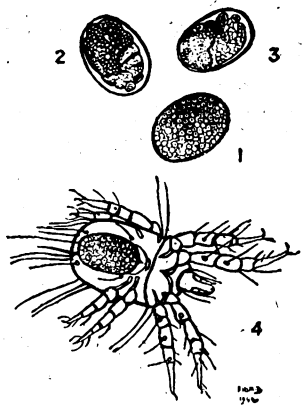
In 1921 one of us published figures of a mite and its egg in human fæces (Manson-Bahr 1921), and from time to time we have seen them in fæcal specimens, but the acarines were invariably dead and no signs of development were traced within the eggs. During the past year, however, we have again been meeting them with increasing frequency and have paid little attention to them thinking that they had been ingested in the food and passed unchanged through the alimentary canal. But recently two freshly passed fæcal specimens from two different people revealed eggs in development from the morular stage to that of the newly hatched nymph. A fully developed adult female (fig. 4) was discovered containing an egg ripe for extrusion. At first sight the eggs (fig. 1) suggested by their size (0·12 mm. × 0·07 mm.) and appearance those of some intestinal trematode, but the shell is by no means so dense or so well-defined and moreover lacks an operculum. The segmenting stage roughly resembles that of a large ancylostome egg, but measurements are naturally much larger (0·1–1·2 mm × 0·07 mm.). Specimens of fæces containing the eggs mounted in saline on slides and covered with sealed coverslips were kept under observation at room temperature in damp petri dishes for 36 hours. The development of the eggs, the budding of the larval legs, and the formation of its cephalothorax inside the egg to the emergence of the nymph could be followed (figs, 1, 2, and 3). It has been difficult to identify the mite with any degree of accuracy, for only females have so far been found, but they are probably examples of *Tyroglyphus siro*, judging by the characters already mentioned. It can be realised that in such a dense medium as fæces, and with the distortion caused by the coverslip, the exact position and length of the hairs and other minutiæ are difficult to discern.



Tyroglyphid mites in freshly-passed fæces. 1. Freshly laid egg. 2. Morular stage. 3. Egg containing fully segmented larva. 4. Adult female *T. siro* in fæces containing ripe egg.

The patient from whom this last specimen was obtained had been examined for recurrent attacks of diarrhœa. He came from the Isle of Man, where he had eaten quantities of over-ripe cheese, but what particular kind we have been unable to ascertain. Efforts to find similar mites in the rationed cheese now being sold have so far failed. But the evidence suggests that this is the cheese mite and that it is capable of developing in fæces during their passage through the intestinal tract. We are publishing these observations, which are admittedly incomplete, with the idea of assisting others to recognise the eggs in the fæces, where as far as can be ascertained their presence has no pathological significance. Neither of the two patients found to be harbouring the mites showed an eosinophilia of over 5%.

REFERENCES

Bohm, L. K. (1920) *Wien. tierärztl. Wschr.* **7**, 11.
Carter, H. F., Wedd, G., D'Abrera, V. St. E. (1944) *Ind. med. Gaz.* **79**, 163; see *Lancet*, 1944, ii, 351.
Gedoelst, L. (1911) Synopsis de parasitologie de l'homme et des animaux domestiques, Brussels.
Hase, A. (1929) *Z. Parasitenk.* **1**, 765.
Hieronymi, E. (1925) *Münch. med. Wschr.* **72**, 2157.
Hirst, H. S. (1920) Natural History, Economic Series. No. 6. London.
Khalil, M. (1921) *Proc. R. Soc. Med.* **14** (*Sect. Trop. Dis.* 24).
Küchenmeister, F., Zürn, F. A. (1881) Die Parasiten der Menschen, Leipzig.
Kunze, A. (1924) *Berl. tierärztl. Wschr.* **40**, 259.
Mackenzie, J. (1922) *J. R. Army med. Cps*, **39**, 339.
Manson-Bahr, P. H. (1921) Manson's Tropical Diseases, London, 7th ed.
Martini, E. (1925) *Ergebn. Hyg. Bakt.* **7**, 294.
Michael, A. D. (1903) British Tyroglyphidæ, London, vol. II.
Moniez, R. (1896) Traité de parasitologie animale et végétale, appliquée à la médecine, Paris.
Patton, W. S., Evans, A. M. (1931) Insects, Mites and Venomous Animals of Medical and Veterinary Importance, Croydon, vol. II.
Reh, L. (1925) *Z. Desinfekt.* **17**, 122.
Reye (1919) *Disch. med. Wschr.* **45**, No. 37.
Vitzthum, H. (1926) *Zool. Jb. A.* **52**, 407.

NEW TECHNIQUE OF SPINAL ANÆSTHESIA

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ANÆSTHETIST TO MANCHESTER ROYAL INFIRMARY

EVEN today spinal anæsthesia is frequently induced by empirical methods with the result that its action is sometimes capricious and occasionally dangerous. Much has been made of the safety factor of the dorsal curve, but it is common knowledge that total spinal anæsthesia is quite readily produced by a relatively small overdose, no matter what the position of the patient.

The spread of a spinal anæsthetic can, however, be limited if the correct strength of solution is used. If a large volume is injected, the height to which sensation will be abolished will be governed by the volume of solution and its concentration. If the concentration is reduced to the minimum which will induce spinal anæsthesia, spread beyond the area in direct contact with solution will become impossible even if the table is tilted in the wrong direction. This safety measure, which is independent of abnormalities of the thoracic curve, of the angle of tilt of the table, and to a large extent of the specific gravity of the cerebrospinal fluid, is much more trustworthy than those at present relied on.

Pannett in 1929 demonstrated that 0·5% and 1% procaine ('Novocain') were inadequate for spinal anæsthesia, but that 1·66% would induce satisfactory anæsthesia

TABLE I—MINIMUM ACTIVE SUBARACHNOID CONCENTRATIONS OF ANÆSTHETIC DRUGS

Anæsthetic agent	Minimum effective subarachnoid strength (%)	
	Rabbits	Man
Amethocaine	0·05	0·1
Nupercaine ..	0·70	0·08
Procaine ..	0·9	1·25

and muscular relaxation. By an experimental method Bieter and his colleagues (1936) have worked out the concentrations of various agents required to produce anæsthesia of the exposed spinal nerves of the rabbit. I have worked out by a process of trial and error the corresponding concentrations for the intact human subject (table I).

The volume of the solutions of the various drugs employed will of course depend on the capacity of the spinal canal up to the level to which it is desired to produce anæsthesia. The published work on this subject proved rather contradictory, but again by trial

TABLE II—DOSAGE OF DIFFERENT AGENTS REQUIRED TO PRODUCE SPINAL ANÆSTHESIA

Operation	Segmental level of anæsthesia	Volume (c.cm.)	Dose in mg. of		
			Procaine	Nupercaine	Decicain
Cystoscopy, hæmorrhoids, &c.	L1	4	100	5	8
Herniotomy and lower limb operations ..	D10	8	120	7	10
Laparotomies ..	D6	12	150	9	12

and error it was found that 4 c.cm. of solution would produce anæsthesia to dermatome L1; 8 c.cm. to D10; and 12 c.cm. to D6. These levels correspond approximately to Poupart's ligament, the umbilicus, and the xiphisternum. These figures are more or less those given by Maxson (1938) for the capacity of the different parts of the spinal subarachnoid space.

On the basis of these volumes and concentrations a dosage table was elaborated (table II). The drug of choice is amethocaine hydrochloride ('Anethaine,' 'Decicain,' 'Pontocaine hydrochloride'). Onset of anæsthesia is rapid, taking rather less than 5 minutes. The duration of the anæsthesia is sufficient for nearly all major surgical procedures, amounting to some 3 hours. With 'Nupercaine' the onset of anæsthesia is rather

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slower and the prolongation obtained by using this agent is not of much significance since there are few operations which cannot be completed under amethocaine. When procaine is employed there is a significant lengthening of the period of anæsthesia from the usual 30–40 minutes to about 70 minutes. The doses mentioned in the table below must be regarded as mimima. Both volume and quantity of drug may be increased by up to 20% in tall or broad patients. When very high anæsthesia is required, as for gastrectomy or cholecystectomy, the volume should be increased to at least 14 c.cm. and the dose of amethocaine to 14 mg. and of nupercaine to 10 mg.

The volume of solution required for this technique is attained by drawing up the dose of amethocaine to be employed into a 10 or 20 c.cm. syringe and then aspirating cerebrospinal fluid into the syringe to the required volume. Only hyperbaric solutions are used and consequently the diluted solutions will also be hyperbaric; in the case of low blocks this factor will limit spread. In order that CSF may be drawn freely into the syringe the needle point must be well within the subarachnoid space. Midline punctures are therefore to be preferred to the lateral approach. Ephedrine should be injected as with any other type of spinal anæsthesia.

This technique has been used for some 200 spinal anæsthetics. The results have been in every way satisfactory.

SUMMARY

A volumetric technique of spinal anæsthesia, applicable to hyperbaric solutions, is described. Spread of anæsthesia is regulated by employing the minimum effective concentration of drug and adjusting the volume of solution so as to reach the required nerve-roots. The method possesses the advantages of the standard Howard Jones technique but onset of anæsthesia is much more rapid and the patient need not be turned.

REFERENCES

Bieter, R. N., Cunningham, R. W., Lenz, O., McNeary, J. J. (1936) *J. Pharmacol.* **57**, 221.
Maxson, L. H. (1938) Spinal Anæsthesia, Philadelphia.
Pannett, C. A. (1929) *Lancet*, i, 271 and 1194.

CREAMS FOR TESTING THE SENSITIVITY OF ORGANISMS TO BACTERIOSTATICS

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WITH the steady production of new chemotherapeutic substances and the development, during treatment, of insensitive bacterial strains, tests for the sensitivity of organisms to bacteriostatics have become increasingly important. Four methods are in common use:

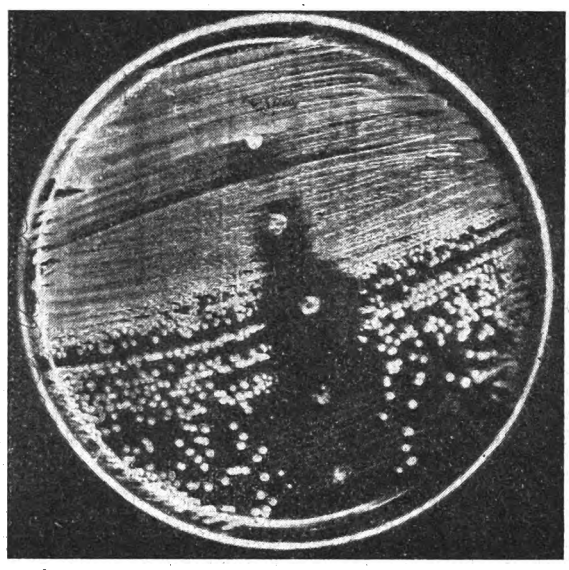
1. The ditch-plate method (Francis 1942).
2. Cup method (Abraham et al. 1941)
3. Agar-hole method (Fleming 1942).
4. Application of paste (MRC War Memorandum No. 10).

The first three, though accurate, are time-consuming if a number of strains have to be tested against more than one antiseptic. The paste method, though quicker, is relatively inaccurate, but we have used it as a basis for the development of a qualitative test which can be employed with any antiseptic or antibiotic. The method is simple and we have demonstrated it to be reasonably accurate.

For penicillin sensitivity tests a cream was prepared according to the directions given by Clark et al. (1943), the final concentration of penicillin being 200 units per gramme. The cream is kept in the refrigerator and tested at weekly intervals against the Oxford H staphylococcus. A stable cream has been in daily use and has given a constant diameter of inhibition of this organism for 9 months. Propamidine cream was prepared by using 1 in 10,000 concentration in a water-miscible base, such as Halden's emulsifying base, but results were not as consistent as those obtained by the use of propamidine jelly prepared by May and Baker, Ltd. Sulphanilamide and sulphathiazole were prepared as a 5% suspension in Halden's base. Gentian-violet, proflavine, and other dyes were used in 1 in 1000 dilution in the same base.

For tests other than sulphonamide sensitivity, a confluent growth of the organism is made either on an agar or a blood-agar plate.

The creams are applied in the centre of quadrants of the plate by the use of a Hagedorn blood-taking needle with three cutting edges. The needle, conveniently mounted on a metal holder, is flamed and thrust for ½ in. into the cream and then pushed vertically into the agar plate until the point comes into contact with the bottom of the petri dish. The



Sensitive strain of staphylococcus showing inhibition by a sulphathiazole cream.

needle is rotated and withdrawn and a small amount of cream is thereby removed and remains in the track of the needle. After flaming and cooling the needle it can be used for another quadrant of the plate with another cream. The plate is incubated overnight and the zone of inhibition measured 16 hours later.

For testing the sensitivity of organisms to sulphonamides the agar plate is made with nutrient agar free of *p*-aminobenzoic acid. A heavy inoculum having been placed on one side of the plate it is carefully thinned out by parallel strokes of a platinum loop, the success of the method depending on the gradual and steady thinning out of the inoculum. Five insertions of cream are used at equal intervals across the plate. Although complete inhibition is often not obtained where the bacterial growth is confluent inhibition becomes obvious where the growth is thinner if the organism is sensitive to the sulphonamide used.

RESULTS

Twenty strains of staphylococci sensitive to penicillin were tested by the agar-cup method, using dilutions of penicillin of 10 units per c.cm. and 1 unit per c.cm., and the results compared with the corresponding inhibition by penicillin cream. The cream produced rings of inhibition of average diameter of 19·5 mm., all figures lying between 15 and 23 mm. Penicillin solution 1 unit per c.cm. on the same strains gave an average diameter of 19·7 mm., all figures lying between 15 and 24 mm. The 10 unit per c.cm. solution gave zones of inhibition averaging 28·4 mm. diameter, figures varying between 24 and 36 mm.

Twenty tests with penicillin cream by this technique were carried out on one sensitive strain of staphylococcus; the diameters of inhibition varied by less than 3 mm.

Insensitive strains showed no inhibition by the cream or by penicillin solution in agar cups.

Similar correlation was obtained with staphylococci and streptococci when tested with propamidine jelly and a 1 in 10,000 propamidine solution in agar cups; in all cases if inhibition was produced the ring given by the jelly corresponded to that obtained with the solution.

No numerical comparison can be made between the sensitivity of organisms to sulphonamides as shown by the ditch method of Francis and that produced by the cream

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technique, because the width of inhibition in each case depends on the proximity of the colonies to each other. Organisms shown to be sensitive however by the former method were always inhibited by the latter, and there is considerable saving of time in the application of cream compared with that needed for the making of sulphonamide trench plates. A typical positive result obtained with sulphathiazole cream and a sensitive staphylococcal strain is shown in the figure.

SUMMARY

A rapid method is described for testing the sensitivity of organisms using antiseptic creams.

The cream method is comparable to the agar-cup and trench-plate methods and can be adapted for use with any antibacterial substance.

REFERENCES

Abraham, E. P., Chain, E., Fletcher, C. M., Gardiner, A. D., Heatley, N. G., Jennings, M. A., Florey, H. W. (1941) *Lancet*, ii, 177.
Clark, A. M., Colebrook, L., Gibson, T., Thomson, M. L., Foster, A. (1943) *Ibid*, i, 605.
Fleming, A. (1942) *Ibid*, i, 732.
Francis, A. E. (1942) *Ibid*, i, 408.

METAZOAN IMMUNITY

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IN 1923, when in charge of the Sir Alfred Lewis Jones Research Laboratory in Sierra Leone, I was able to demonstrate that an acquired human immunity against a metazoan parasite was a possibility. The experiments were carried out with the larvæ of a fly, *Cordylobia anthropophaga*. This scientific name of the "tumbu" fly is sufficiently suggestive of the power which its larvæ possess of burrowing into the skin of human beings and of producing myiasis. The starting-point of the investigation was the occurrence in September, 1922, of a natural infection with nine of these larvæ, which underwent growth and development in the cutaneous and subcutaneous tissue, and were subsequently removed when 6–8 mm. long. After the lapse of 4 months repeated attempts were made to reproduce infection in the same subject by placing first-instar larvæ on his skin and allowing them to burrow into it. Although the larvæ found no difficulty in entering the skin they could not grow and develop there. In a paper by Blacklock and Thompson (1923), the evidence of the failure of these repeated infections is set out in a table. The first attempt to produce infection was made on the fingers; the remainder on the arm. The dates of the attempts in 1923, with the number of larvæ penetrating the skin shown in parentheses, were as follows: Jan. 30 (2); Feb. 18 (4); March 7 (4); March 30 (6); April 6 (12); April 10 (4); and April 23 (5).

During this work an interesting phenomenon forced itself on my attention. This was a well-marked cutaneous reaction, which in the successive experimental inoculations became progressively more extensive and striking. At each of the last six attempts at infection the local reaction was quite severe. The penetration of the larvæ was accompanied by great itching, and was followed within a few minutes by pronounced local signs and symptoms. At the point of entrance of each larva a white bleb quickly formed and spread in all directions. The larvæ were placed well apart, on an area of about 2 in. by 3 in., yet in all cases, within 50 minutes, the urticarial weals had coalesced. The irregular swelling produced was over 3 in. in diameter and raised in the centre to about ¼ in. Around the white area was a zone of deep congestion which faded away at the margins. The rather tense swelling stood out clearly against the red background. At the same time severe itching was felt over the whole area affected. The pricking sensation caused by the larvæ boring in at the several points was also noticeable. By the next day the pricking sensation and both the swelling and the redness had disappeared, and the itching had to a large extent subsided.

A fairly comprehensive study of the flies (including descriptions of all the early stages and the adults), and of their habits and behaviour was contained in the paper mentioned. The finding recorded there that the wild rat is the reservoir from which man ultimately derives this infection added yet another to the long list of diseases associated with that pestiferous animal. Among the conclusions reached in the paper were—

> "An immunity has been proved experimentally to develop against attacks of the larvæ, not only in man but in animals.
>
> "The development of such an immunity in the case of cattle, in similar forms of myiasis, is considered a possibility and worthy of investigation."

This discovery, which seems to have afforded the first experimental proof of such an acquired human immunity against metazoa, was followed by further investigations. In 1927 Blacklock and Gordon published an account of work which confirmed the feasibility of producing a high degree of immunity in guineapigs against the larvæ. Photographs included in the paper showed in a striking manner the absence of damage to the skin of the immunised animal, in contrast with the very severe lesions produced in the non-immunised control, after the application of a large number of first-instar larvæ to the skin.

At this stage the Empire Marketing Board became interested, largely no doubt owing to the importance attached to the possibility of evolving a method of immunising cattle against such causes of severe and damaging myiasis as the warble fly. With the aid of a generous grant from the board attempts were made to devise a practical method of protection. Our hopes were unfortunately not realised, but this is not of course to imply that they are not capable of being realised. It may only mean that the ground was insufficiently covered. The time which could be given to the subject may have been too limited; and many routine duties had to be carried on at the same time by members of the staff. Our basic knowledge about this novel and complex subject was, in those days, extremely scanty, and the apparatus and techniques at our disposal were hardly adequate by present-day standards. There were, in addition, the many well-recognised difficulties—not encountered in temperate climates—which militate against the success of such researches in the tropics. The results of the last part of the investigation were published in 1930.

Several American workers had, meanwhile, taken up the study of the production of experimental metazoan immunity with enthusiasm; much work was done and definite progress was recorded. In 1929 Taliaferro's monograph on the immunology of parasitic infections was published; in 1930 H. M. Miller, jun., of Washington University, published a preliminary note of his experiments on immunity of the white rat to *Cysticercus fasciolaris*; in 1931 Miller published three papers, that issued in August being on the production of artificial immunity in the albino rat to a metazoan parasite; he also published six papers in 1932, all dealing with this metazoan parasite, and describing the various methods he had devised for immunising against it.

One of the more recent American publications which give full weight to the importance of metazoan immunity is that by Culbertson (1941), in which the reader will find a useful account of immunity in such metazoan infections as helminthiasis and myiasis. Culbertson set out the various tests which have been employed for the clinical detection of these infections in man and animals—the complement-fixation test for echinococcus disease in 1906, the precipitin test for it in 1907, and the skin test in 1911—and referred to the various tests for the diagnosis of schistosomiasis (1910), trichiniasis (1928), ascariasis (1924), strongyloidiasis (1925), filariasis (1930) and similar infections.

More British workers should follow these lines of research. Many young scientists who can make full use of modern techniques and recent advances in biochemistry and allied subjects have a great opportunity in this field to make discoveries which may prove not only of academic interest but of much practical value. There is not space here even to enumerate the parasitic infections of man for which preventive measures are urgently needed. Control of the metazoan diseases, desirable enough in temperate climates, is of particular importance in those warm latitudes in which many British colonies are situated.

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Preliminary Communications

PENICILLIN LAMELLÆ IN EYE CONDITIONS

THERE is considerable evidence that penicillin, in the form of drops containing 500 units to the cubic centimetre, is a useful therapeutic agent in superficial infections of the eyes and eyelids.[1] The disadvantage of this preparation is that solutions of calcium and sodium penicillin deteriorate, even when kept at 0° C, and tend to become infected with penicillin-insensitive organisms. The solid form retains its activity for six months or longer at room temperature. Penicillin treatment of the eyes, therefore, has been almost entirely limited to institutions where refrigerators are available, and few patients have been able to receive it at home. We have investigated other methods for the prescription of penicillin in ocular conditions. Gelatin lamellæ containing penicillin were tried, but were unsatisfactory because they were unstable and the strength of drug failed rapidly. Lamellæ of lactose, each containing 100 units of calcium penicillin, were subsequently tried. They have proved, therapeutically, as satisfactory as penicillin drops, in a small number of cases, and their potency has remained unchanged after two months at room temperature. We intend to publish our results in full later, but we suggest that this method provides a substantial advance in the use of penicillin in ophthalmology, and that it will enable it to be used conveniently in the treatment of outpatients, and also may enable the drug to be employed for eye conditions in coming campaigns in the Far East.

1. Cashell, G. T. W. *Brit. med. J.* 1944, i, 426. Milner, J. G. *Ibid*, 1944, ii, 175. Crawford, T., King, E. F. *Brit. J. Ophthalmol.* 1944, **28**, 373.

We are indebted to the Director-General, Royal Air Force Medical Service, for permission to publish this note, to Squadron-Leader A. C. T. Vaughan who performed the bacteriological tests; and to Messrs. Burroughs Wellcome and Co. who prepared the lamellæ.

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A. G. CROSS, M D CAMB., F R C S, Squadron-Leader RAF

Medical Societies

NUTRITION SOCIETY

NUTRITIONAL RÔLE OF THE ALIMENTARY MICROFLORA

THE Society met on Dec. 30, 1944, at the London School of Hygiene, when a discussion on the

Microbiology of Rumen Digestion

was opened by Mr. A. C. THAYSEN, PH D, of the chemical research laboratory, Department of Scientific and Industrial Research, who spoke of the microbiological aspect of rumen digestion with special reference to the digestion of cellulose. Very conservative estimates applied to his experimental data had shown that the dry weight of the microbial substance formed in the rumen of an ox during 24 hours was at least 400 g., containing 180 g. protein, 80 g. carbohydrate, and 8 g. "fat," and a total of 139 g. carbon. There was good evidence that this substance was digested by the host. The carbon thus made available represented some 15% of the total carbon of the ingested cellulose, amounting to some 2 kg. daily. The calculation undoubtedly underestimated the microbial synthesis; moreover, at least 11% of the cellulose carbon appeared in the rumen in the shape of organic acids, which were rapidly utilised by the host. Dr. Thaysen underlined the importance of the synthesis of protein and of vitamins by the microflora of the rumen.

Mr. F. BAKER, of the County Technical College, Guildford, emphasised the shortcomings of purely cultural methods of study of the microbial population of the gut, and described methods of direct microscopic observation by means of which, for example, the presence of iodophil species which had never been isolated in pure culture could be disclosed.

Mr. J. A. B. SMITH, D SC, of the Hannah Dairy Research Institute, spoke of the formation of protein. Various feeding trials in this country and abroad had shown that ruminants could utilise non-protein nitrogen in the form of urea or of ammoniated sugar-beet pulp for the production of meat, milk, and wool, provided sufficient carbohydrate was present to balance all the nitrogen contained in the diet. The proportion of nitrogen supplied as urea should not exceed 40%. The principal theory explaining the utilisation of non-protein nitrogen was that the bacteria abounding in the rumen used it for their own growth and multiplication and converted it into protein which was then digested by the host. Experiments had been in progress for several years at the Hannah Institute designed to collect evidence either for or against this theory. An ox with a rumen fistula was used. The more liquid fraction of rumen contents was incubated with urea and the synthesis of protein followed. In typical incubation experiments the urea was very rapidly converted to ammonia, the non-protein nitrogen (mainly the ammonia fraction) decreased, and there was relatively rapid synthesis of protein during the first 3 hours of incubation. It was calculated that some 300 g. of protein—roughly a quarter of the protein requirements of a cow yielding 2 or 3 gallons of milk daily—could be synthesised in this way. The main contributors to this synthesis were the micro-iodophil bacteria. Simultaneously with synthesis, hydrolysis of protein was observed to proceed in the rumen.

Mr. M. H. M. ARNOLD, of the research department of Imperial Chemical Industries, had calculated that the nitrogen of urea was utilised for milk-production at least as efficiently as that of blood-meal. He suggested that experiments on the utilisation of non-protein nitrogen should be of long duration to obtain predominance in the rumen of the most efficient organisms.

Mr. S. BARTLETT, PH D, of the National Institute for Research in Dairying, University of Reading, said that results of large-scale experiments on the value of urea for milk-production had been disappointing; addition of it to a diet already satisfactory depressed the milk yield and the supplement had no effect with a low nitrogen diet. The reason was probably that the practical diets lacked the readily available carbohydrate required for protein synthesis.

Sir JACK DRUMMOND, FRS, asked whether urea fed to cows would pass into the milk to any appreciable extent, but Dr. Smith said that the very small quantities present would be entirely harmless.

Vitamin Synthesis in the Alimentary Tract

Mr. S. K. KON, D SC, of the National Institute for Research in Dairying, reviewed the synthesis of vitamins by micro-organisms of the alimentary tract. The fact that ruminants could be maintained for long periods on a diet very low in certain vitamins had been noticed 30 years ago by Theiler, Green, and Viljoen working at the Onderstepoort institute in South Africa. With great foresight they attributed this faculty to the synthetic activity of the bacterial flora of the intestines. Since then the ability of ruminants to manufacture symbiotically the vitamin-B complex had been firmly established, and the formation in the rumen of riboflavine, vitamin B_6, pantothenic acid, nicotinic acid, and also of vitamin K had been experimentally demonstrated. The position regarding vitamin B_1 was curious: that the cow was independent of an exogenous supply of the factor had been proved beyond doubt, but it was possible that it was synthesised outside the rumen. The vitamins produced in the rumen were absorbed by the animal after passage through the true stomach. It had been known for a long time that the intestinal flora of other animals was also able to produce "vitamin B" and that experiments could be vitiated by coprophagy of experimental animals. Normally, when coprophagy was prevented, non-ruminants such as rats could benefit only to a very limited extent from the synthetic activities of the

PROFESSOR BLACKLOCK: REFERENCES

Blacklock, D. B., Thompson, M. G. (1923) *Ann. trop. Med. Parasit.* 17, 443.
— Gordon, R. M. (1927) *Ibid*, 21, 181.
— — Fine, J., Watson, M. (1930) *Ibid*, 24, 5.
Culbertson, J. T. (1941) Immunity against Animal Parasites, NY.
Miller, H. M. jun. (1930) *Proc. Soc. exp. Biol., NY* 27, 926. (1931) *J. prev. Med. Chicago*, 5, 429.
Taliaferro, W. H. (1929) Immunology of Parasitic Infections, NY.

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intestinal flora. At times, however, a condition of starch dyspepsia developed spontaneously in laboratory rats, and the phenomenon first observed by Fridericia in Denmark, and called by him "refection," enabled them to grow and thrive without an exogenous supply of the vitamin-B complex. Kon and his collaborators had found that with raw potato starch, the least digestible of starches, refection became the rule rather than the exception; they advanced the suggestion that, regarding its ability to absorb vitamins produced in the intestine, the refected rat became similar to the ruminant, the cæcal region combining the rôles of the paunch and of the true stomach. A peculiar phenomenon had been noticed in the rabbit—this animal passed two types of fæces, normal during the day and abnormal at night. The night fæces, closely resembling cæcal contents in composition, were seized and swallowed by the rabbit directly from the anus and doubtless constituted an additional source of the vitamin-B complex and of other factors.

Much valuable information about the synthesis of vitamins in the intestinal tract of animals and man had resulted from the application of a new technique, making use of the bacteriostatic action of sulphonamide drugs and especially of those which were poorly absorbed from the gut like sulphaguanidine and succinylsulphathiazole. The interference of these agents with the intestinal flora affected the vitamin economy of the animal. Of the various deficiency states induced by these sulphonamides, the leucopenia, granulocytopenia, and anæmia produced were probably closely related to a disease appearing spontaneously in monkeys receiving purified diets which had been extensively studied by Lucy Wills in this country, and also to certain states in man. Dr. Kon had obtained striking effects from the administration of sulphaguanidine to refected rats which were especially sensitive to such treatment because they had to derive the whole of their supply of the vitamin-B complex from endogenous sources. He then described the observations (reviewed in THE LANCET of Dec. 30, p. 854) of Najjar and Holt in the United States, and of Ellinger, Coulson, and Benesch in this country, concerning the endogenous synthesis in man of vitamin B_1 and nicotinic acid, and also the more recent American work on the formation of riboflavine in the human gut.

Mr. L. J. HARRIS, D SC, director of the Dunn Nutritional Laboratory, Cambridge, said that partial refection of varying intensity may be a very complicating factor in vitamin-B assays, especially of starchy foods. In his laboratory it had been necessary to use with such foods the bradycardia method because the ordinary growth method gave erroneous results. He underlined the value of sulphonamides in the study of refection.

Mr. A. EDEN, D SC, of the School of Agriculture, Cambridge, spoke of his work on coprophagy in the rabbit.

Prof. L. S. FRIDERICIA of Denmark gave details of the work on refection carried out in his institute and published in Scandinavian periodicals. He emphasised the connexion between the presence of starch and the synthetic activities of intestinal bacteria, equally noticeable with the ruminant and with the refected rat. He suggested that in man the formation of vitamins in the gut might well be affected by starch dyspepsia.

Sir JOSEPH BARCROFT, FRS, Mrs. R. A. MARSHALL, Mr. A. T. PHILLIPSON, and Mr. S. R. ELSDEN, of the Animal Physiology Unit, Cambridge, spoke of the production, absorption, and utilisation of the volatile acids in the rumen. Gastric digestion in the ruminant consisted primarily of the fermentation of carbohydrate, which was followed by true peptic digestion. The carbohydrate derived from foodstuffs such as grass was for the most part digestible only by the aid of bacteria, and the efficiency of the process could be judged by the fact that more than 50% of the crude fibre of grass was utilised. The lower fatty acids—acetic, propionic, and butyric—were the principal end-products of fermentation in the rumen. The total quantities formed were substantial and the amount present in the rumen of sheep taken straight from pasture expressed as acetic acid was of the order of 60 g. There was a sharp gradient of concentration of the fatty acids along the alimentary tract, an abrupt fall taking place in the abomasum or fourth stomach. Experimental evidence showed that this was due to direct absorption of the acids from the rumen, reticulum, and omasum. The blood draining the rumen contained more of these acids than blood from other parts of the alimentary canal or than peripheral blood. The total amount absorbed in this way by a sheep was of the order of 100 g. a day, or about a sixth of the intake of available carbohydrate, and there was no doubt that the ruminant took its vinegar as a food and not as a relish. The lower fatty acids were easily utilised, acetic acid better than propionic, and the perfused rabbit heart made, if anything, better use of acetic acid than of glucose. The mode of utilisation was under investigation by indirect calorimetry, by the use of acetic acid with labelled carbon, and by experiments with phloridzinised animals. The study of the bacterial flora of the rumen had indicated that yeast-like organisms, iodophil cocci, and members of the genus propionibacterium were definitely associated with the fermentation of carbohydrate.

Reviews of Books

Tropical Medicine

(5th ed.) Sir LEONARD ROGERS, MD, FRCS, FRS; Sir JOHN MEGAW, MB. (Churchill. Pp. 518. 21*s*.)

THIS well-known textbook has now undergone more extensive revision than in any previous edition. Portions of some sections, notably those on malaria, the leishmaniases, the trypanosomiases, the dietetic disorders, and the fevers of the typhus group, have been rewritten. While the original scope and general arrangement of the volume have been adhered to and additional information has been inserted, the additions have been countered by condensation of matter already there. Its actual bulk has even been reduced by cutting the margins and by using a thinner war-time paper. This is important for Service medical officers overseas, who will find "Rogers and Megaw" a handy companion.

Annual Review of Physiology

Vol. VI. Editors: J. M. LUCK; V. E. HALL, Stanford University. (Lewis. Pp. 630. 31*s*. 6*d*.)

THE forebodings inspired by an introductory lament (in verse) to this volume over the defection of certain too-busy reviewers are not fulfilled. The surviving reviews are a little longer than the average, a little more inclined to the narrative form—both desirable qualities—and as comprehensive as war-time conditions allow. It is encouraging to notice that the editors are alive to the demands of the times, and we welcome a newcomer to the contents in the shape of industrial physiology. Two or three authors have given their subjects a personal bias, and the reader a refreshing change. Now that the *Annual Review* has become established, the editors can afford sometimes to encourage the treatment of a special department of a subject. The pool of reviewers which can still be drawn upon is impressive. Three contributors are English, and we hope that as conditions improve a sprinkling of other foreign reviewers may be secured, even if their contributions have to be translated.

Practical Anæsthetics

J. ROSS MACKENZIE, MD ABERD., DA, lecturer on anæsthetics, University of Aberdeen, senior anæsthetist, Royal Infirmary, Aberdeen. (Baillière. Pp. 136. 10*s*. 6*d*.)

THE name of the author, the title, and the opening paragraph of the preface of this book raise high hopes, but the contents are a little disappointing. It is scarcely the "foundation on which the . . . hospital resident may build the practice of anæsthesia" which Dr. Mackenzie hoped to make it. Thus, on the first page, the reader is referred, for a rapid and useful estimate of the physical condition of the patient before and during operation, to Moots's Index. In discussing aperients it is stated that the regular normal daily stool need not be disturbed except at the request of the surgeon. Some errors have crept into the drawing and legends of the illustrations, and the text does not escape minor errors. Stress is laid on the choice of anæsthetic agents for particular operations, but the advice given could be more helpful.

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THE LANCET

LONDON: SATURDAY, JANUARY 20, 1945

The Infected Hand

IMPAIRED function of the hand is so serious a handicap to the man or woman who has to earn a living that the prevention and treatment of infections in this area must be looked on as a major problem. Better prophylaxis has been attained in the past few years through the expansion of industrial medicine. The industrial nurse is responsible for seeing that proper regard is paid to all the small pricks and abrasions to which factory workers are liable, and that expert attention is obtained where necessary. Further improvement along these lines, with special instruction for works doctors and nurses, could well be encouraged. In treatment there remain the old principles, the chief of which is that the infected part should be put at rest. Systemic administration of sulphonamides early and in adequate dosage has done much to improve results, especially in streptococcal lesions. Systemic penicillin promises great things, not only against streptococci but also in the locally more destructive and less responsive staphylococcal infections. Local chemotherapy, however, is less satisfactory, because access to the whole infected area is difficult and interferes to some extent with local rest. Failure to immobilise an inflamed finger will increase the inflammatory exudate and therefore the subsequent stiffness, as well as encouraging spread of infection. Hence the local application of penicillin, requiring dressings at least once daily, demands justification by results incontestably better than those from general chemotherapy, rest, well-timed incision, and rest again. FLOREY and WILLIAMS [1] have shown that such results may indeed be claimed, though their "control" cases might have provided better competition had they had less frequent dressing, no saline baths, and continuous plaster immobilisation. The diminished fibrous-tissue reaction which they observed with penicillin should lead to quicker and better return of function.

The best time for incision is still controversial and largely a matter for decision in the individual case. The general rule is to await localisation before interfering, but there are areas where this is to court trouble; pulp infections are an example. To give local penicillin access to the infected tissues, very early and rather bold incision—sometimes through uninfected areas—is practised; and here again the sacrifice of well-worn surgical principles can only be justified by results. The treatment of tendon-sheath infections, the most serious of all, is still unsatisfactory. BUTLER [2] notes a relatively better prognosis in streptococcal cases, for which he advises a small incision in the proximal part of the sheath and plaster immobilisation. He gives a hopeless prognosis for staphylococcal tendon-sheath infections, in which he says the tendon always dies and bones and joints become infected whether the incision is early or late. It is here that FLOREY and WILLIAMS offer some hope of help from penicillin. One common difficulty is to detect exactly which tissues are infected. A bloated and very painful finger, possibly with one or more sinuses, often gives no real indication whether the sheath is infected or not. Careful enlargement of existing sinuses and inspection in a bloodless field may show that the sheath is swollen and roughened, and the contents turbid; but the diagnosis may not be easy, and accuracy is particularly important when penicillin is used, because this substance will not cross membranes such as tendon sheaths, by whatever method administered.

The dressing applied after incision must not make the finger sodden, and magnesium sulphate paste is the best of the hygroscopic agents. (Magnesium sulphate and glycerin are now obtainable once more.) The dressing must not be irritating; and in this connexion the unpleasant and protracted skin reactions that may follow external application of sulphonamides should be remembered, though they are uncommon when the application is to so small an area as the finger. SMITH [3] notes that a thin serous discharge from the wound may be an early sign of sulphonamide sensitivity. The dressing should preferably not stick, and of course where there is much discharge this will not happen whatever is put on. Finally, the dressing must allow adequate drainage. The one that perhaps meets these requirements best is tullegras with a light dusting of sulphathiazole powder, the whole being encased in plaster for several days at least.

Cavernous Sinus Thrombosis

BACTERIA may invade the cavernous sinus by six different routes—the six anatomical venous communications—and the result may be an acute thrombophlebitis or a slow obliteration of the sinus. Invasion along any route may give rise to either clinical type of infection, but the commonest combinations are acute infection from anterior veins, and slow obliteration from posterior veins. EAGLETON'S monograph,[4] which contains examples of all the possibilities, is almost terrifying in its disclosure of dreadful results from the most trivial wounds and infections of the face, but fortunately the vast majority of cases of aural and nasal suppuration avoid the catastrophes he describes. The symptoms and physical signs in acute fulminating cavernous sinus thrombosis are striking enough to impress the most casual clinician, and treatment should never await their full display. The usual source of infection is a septic lesion of the face with spread along the veins entering the sinus anteriorly. Erythema of the eyelids and dilatation of the superficial veins appear early, and are followed by proptosis, chemosis, and papilloedema. These signs are due partly to the venous obstruction and partly to lymphatic engorgement and blockage; sometimes also to pus in the orbit. In addition, there are the manifestations of general blood-stream infection: swinging temperature, rigors or chills, sweating, and formation of metastatic abscesses. The chronic cases arise chiefly from aural suppuration with retrograde thrombosis from the lateral or sigmoid sinuses along one of the petrosals. This is usually a process sufficiently slow for a collateral circulation to form. Consequently the classical signs of venous obstruction are absent or transient, although subsequent phlebitis of

1. Florey, M. E., Williams, R. E. O. *Lancet*, 1944, i, 73.
2. Butler, E. C. B. *Lond. Hosp. Gaz.* June, 1944.
3. Smith, C. H. *Ann. Surg.* 1944, 119, 266.
4. Eagleton, W. P. Cavernous Sinus Thrombophlebitis, New York. 1926.

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the sinus wall or of the ophthalmic veins may cause chemosis and exophthalmos. The diagnosis is difficult and cases may pass unrecognised. Rarer forms of thrombosis follow spread along the pterygoid venous plexus or from the sphenoidal or other nasal accessory sinuses, or from direct contact with acute suppurating petrositis, and each may give rise to the acute or chronic syndrome.

Whatever its underlying cause, venous thrombosis must be regarded as a protective mechanism following on phlebitis. The thrombus may be aseptic—that is, the body defence may have overcome and destroyed the infecting organisms before or while the clot is forming—or septic, when this attempt has been unsuccessful. It is in this way that to the local effects of venous occlusion may be added the general ones of toxæmia together with septicæmia or pyæmia. Treatment must be directed against the general effects of the infection, and may also be needed to relieve the local effects of venous obstruction, since these can be disastrously incapacitating. But it is essential to remember that the thrombosis is a part of the natural mechanism of repair tending to a spontaneous cure. These principles have long been appreciated and attempts have been made to apply them in cavernous sinus thrombosis by direct surgical attack on the sinus itself and its tributaries and by more conservative methods such as serotherapy, blood-transfusions, and chemotherapy. In reviewing the cases successfully treated up to 1936 CAVENAGH [5] found that out of a total of something less than 50 cases (the number is uncertain owing to overlapping references and doubtful diagnosis) probably not more than 7 were of the acute infective type. Treatment by radical operation was adopted in 3 of them. Of the remainder, only 2 had been treated by operation on the sinus itself; the others cleared up with surgical eradication of the primary source of infection and of any localised areas of suppuration. Conservatism is a good rule in treating acute pyogenic infection of the sinus, operation being reserved for cases where pus has formed or there is necrosis of bone. Other methods of meeting the original onslaught of the infecting organisms are essential, preferably those acting in harmony with the normal body processes. EAGLETON (pp. 156–7) prophetically wrote: "The nature of the pathological anatomy of thrombophlebitis . . . would appear to be favourable for treatment by sterilisation of the blood-stream by . . . bactericides. . . . In the near future there will be discovered specific chemical compounds which will influence the different pyogenic infections of the blood-stream . . . and will be specific for (each type)." The sulphonamides and penicillin have fulfilled the greater part of this prediction. The sulphonamides are now part of the routine treatment of the early stages of an acute pyogenic infection of any severity, and their success in sterilising the blood-stream and the forming thrombus in the cavernous sinus has been recorded by SEYDELL,[6] MORRISON and SCHINDLER,[7] WOLFE and WOLFE,[8] and others. Since many of these sinus infections arise from superficial staphylococcal lesions it was to be expected that even greater success would be achieved with penicillin, and the hope looked like being fulfilled when, in their first series of infections treated with penicillin, FLOREY and his colleagues [9] restored a boy with cavernous sinus thrombosis from a moribund state to convalescence. This boy later died of a ruptured mycotic aneurysm, but subsequent cases have been more fortunate. Thus JOHNSTONE reported in these columns on Jan. 6 a case in which complete recovery was attained although penicillin treatment was unavoidably delayed for 10 days. Full doses of a sulphonamide and penicillin would seem the most promising combination, since some strains of streptococci and staphylococci, as well as *B. proteus* and *Ps. pyocyanea*, are resistant to one or other of these drugs. Chemotherapy is likely to cure just that type of case where the outcome was formerly almost hopeless—spread of infection from anterior veins draining a septic lesion of the face—because a lesion here is plainly visible, and any divergence from routine healing, or signs of more deep-seated mischief, become rapidly obvious, so treatment can be begun in time. The osteoplastic flap of Kroenlein, evisceration of the orbit, and other dramatic operative procedures are likely to be relegated to history except for cases where thrombosis and infection reach the sinus from more obscure lesions, and even here chemotherapy may succeed in sterilising the clot before it liquefies to pus.

It has been suggested that thrombus formation can be prevented by the administration of the anticoagulants heparin and dicoumarol. In addition to 3 recoveries with heparin recorded by LYONS [10] and SCHALL,[11] another was reported by MUNTARBHORN in our issue of Jan. 6. In all these cases full doses of a sulpha drug were also given. LOCKWOOD, WHITE, and MURPHY,[12] too, employed heparin and dicoumarol as an adjunct to penicillin in a successful case. But with the available evidence of recoveries with chemotherapy alone, and in the absence of controls, the addition of anticoagulants cannot yet claim to have established its practical value. They may have a part to play in the cases of chronic obliterative thrombosis which arise from the lateral sinus and spread to the cavernous sinus, for if the diagnosis is made very early heparin or dicoumarol could possibly limit the extension of the clotting process. In other cases it does not seem justifiable to oppose a natural defence mechanism.

A Regional Plan

THOSE who put their faith in regional planning will be pleased with an interim report just issued by the medical services committee of the Yorkshire Regional Hospitals Council.[13] If this is a fair specimen of a regional plan, it is certainly encouraging—always provided the plans can be translated from paper to practice. The committee is nicely balanced between the voluntary hospitals, the medical officers of health, the university faculty of medicine, and the general practitioners of the region; which, it should be explained, covers the East and all save the southern tip of the West Riding, but not the North Riding, which relates naturally to Tees-side.

5. Cavenagh, J. B. *Brit. med. J.* 1936, i, 1195.
6. Seydell, E. M. *Arch. Otolaryng., Chicago*, 1939, **30**, 429.
7. Morrison, L. F., Schindler, M. *Ibid*, 1940, **32**, 948.
8. Wolfe, C. T., Wolfe, W. C. *Ibid*, 1941, **33**, 81.
9. Abraham, E. P., Chain, E., Fletcher, C. M., Gardner, A. D., Heatley, N. G., Jennings, M. A., Florey, H. W. *Lancet*, 1941, ii, 177.
10. Lyons, C. *Ann. Surg.* 1941, **113**, 113.
11. Schall, L. A. *J. Amer. med. Ass.* 1941, **117**, 581.
12. Lockwood, J. S., White, W. L., Murphy, F. D. *Ann. Surg.* 1944, **120**, 311.
13. Nuffield Provincial Hospitals Trust. Yorkshire Regional Hospitals Council. 1944. 6, Butt's Court, Leeds, 1.

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The proposals follow closely those made in the interim report of Medical Planning Research,[14] and it is interesting to see how these theoretical conceptions prove applicable to an actual area. An intermediate type of hospital, between the key hospital and the peripheral hospital, is introduced under the name of district hospital. It is proposed that the 3 major or divisional hospital centres should be at Leeds, Bradford, and Hull; Leeds, as the university centre, would be the main one. There would be 9 district hospital centres, all staffed by whole-time specialists. Special departments would be situated within, and be part of, a hospital centre—an arrangement beneficial alike to patients and staff. There would be no sharp lines of demarcation to prevent a patient going to a hospital outside his own area, or even his own region, if he wished to do so; and this would remove one of the biggest disadvantages of the present municipal hospital service. Throughout the plan, municipal and voluntary hospitals are treated on a par, with common visiting specialist staffs, and common central admission bureaux. In estimating staff and bed requirements, the pre-war figures are omitted since those available are thought to be unreliable. However, it stated that a 15–20 per cent. increase in general surgical beds is needed, while the increase in beds for dermatology and thoracic surgery must be several hundred per cent. Again, there will be need of twice as many general physicians as before the war, while pædiatricians should be increased seven-fold. Such figures make one wonder how the people of Yorkshire have survived so long.

Detailed reports are made on each of the specialties. Whereas the subcommittee on general practice advocates surgery by general practitioners in peripheral hospitals, the main committee expects it to die out. Again, the GPs want a resident house-officer in each of their hospitals, while the main committee apparently does not. A house-officer would certainly be needed if the visiting surgeons were to do any large volume of work peripherally; but inasmuch as his presence might be an extra inducement to the practitioner to "do a spot of surgery on the side," he might not be an unmixed blessing. It is at the periphery that the plan seems to have been least clearly thought out; and it is here that things are most likely to go wrong, from the patient's point of view. By and large, however, the proposals appear sound; and provided the Minister of Health injects the necessary cash, the wheels of the Yorkshire regional hospital service should turn smoothly.

14. *Lancet* (Suppl.), Nov. 21, 1942.

RECRUITMENT OF B1 OFFICERS.—To meet the needs of the Services in forthcoming campaigns the Central Medical War Committee will shortly be issuing preliminary recruitment notices to all resident medical officers, resident surgical officers, and others who have held a B1 post or posts for two years or more (Ministry of Health circular 180/44). The Minister of Health is not unmindful of the needs of the civilian population and he appreciates that many of these doctors have been retained to deal with Service patients treated under the Emergency Hospital Scheme, but he is advised that it is now necessary to consider their recruitment and he urges hospitals, wherever possible, to release them. Substitutes may be found among holders of A and B 2 posts, and he suggests that it will be to the advantage of hospitals after the war if these young men, who would otherwise have been recruited to the Forces, can now be given further experience. Replacements may also be found among medical officers invalided from the Forces or released on the application of the Central Medical War Committee.

Annotations

UNIVERSITY STUDENTS AS CRITICS OF FACTORY LIFE

TWENTY students from the Universities of Oxford, London, Cambridge, St. Andrews, and Liverpool spent six weeks of their vacation working in a large factory. They were acting as "guineapigs" in a field experiment aimed at discovering whether a certain chemical produced ill effects on the people who had to handle it. During their stay at the factory they were encouraged to record their impressions of the social and technical side of the work. Dr. Alice Stewart and Miss Mary Lamb summarise and discuss the students' impressions of their factory life.[1] At first they thought that the welfare conditions were good, but they later realised that there were snags, and that production was hampered by a number of small irritations which, taken together, induced a cynical or indifferent attitude on the part of the workers. The students soon learnt that nothing is more certain to undermine a fundamental willingness to work than constant petty irritations and mismanagements, and they felt also that too little was done to ensure that the worker really knew what he was doing and felt it to be important. This, they thought, was the chief cause of absenteeism, slackness, indifference, and careless work. Another cause of absenteeism, particularly amongst the married women, was the delay caused by irregularity of supplies of goods essential to production. The married women, with homes to run, inevitably felt that they had something better to do than to hang around wasting time at the factory. In this factory little was done to familiarise the workers with the possible consequences of carelessness at work. The products of the factory were dangerous to the workers themselves and to those who had to handle them after they left the factory. The students approached the management and were given a special lecture on the nature and uses of the products on which they were engaged; they were also taken on a tour of the whole factory so that they might see how the various processes were related. It was not customary to give these privileges to the other workers in the factory.

The students commented unfavourably on the general factory hygiene. They found the sanitary accommodation most unpleasant because it was only cleaned once a week; most of the time the place was very dirty and foul-smelling and there were no locks on the lavatory doors. The workers appeared to have little confidence in the factory doctors. Medical examinations were said to be perfunctory in the extreme.

No-one who has experience of industry will quarrel with the conclusions reached by Dr. Stewart and Miss Lamb, but it is perhaps a mistake to say, as they do, that theirs is a new approach to the problem. Again, no generalisations about factory conditions should be made from those observed at this particular factory, which was obviously large—too large—new, and unwieldy. There had been apparently little time for personalities and processes to settle down. In old-established factories things are better. Sanitary accommodation is clean and wholesome in many of them. Workers have, and use, the power to express themselves either direct to the management or through works councils and joint production committees. Many of them make suggestions, which are accepted, for improvement in working conditions and in technical processes. In many instances the better "channels of communication" for which the authors plead are already laid down. But it nearly all depends on the people in charge and on their personalities. When the factory is small enough for each worker to be personally known to the manager, there is little or no trouble. There are of course unhappy factories, but also many happy ones, and these are usually places employing

1. *Industrial Welfare*, Nov.–Dec., 1944, p. 175.

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a thousand workers or less. The larger factories often have a somewhat soulless atmosphere. As for the doctors in the students' factory, it is permissible to wonder how much they were irritated and hampered by lay control and how far they were encouraged to run their own show. Doctors, as well as students and workers, react unfavourably to an unsympathetic atmosphere.

PREPAYMENT HEALTH SCHEMES IN THE USA

THE United States were built by individualists, pushing ever further west into a hard and unknown land. In such an atmosphere, where any man can still rise to the top by his own ability, opportunity has naturally been valued more highly than security, and self-help more than governmental assistance. This state of mind is reflected in the attitude of American doctors to social security and health service schemes. For a long time the American Medical Association did not look with favour on organised health-insurance schemes. Despite this, such schemes have developed progressively, and a series of articles in the Association's journal [1] set out details of the way in which some of them are organised. Broadly speaking, the AMA is now supporting prepayment schemes organised jointly by doctors and industry, but not those in which doctors are employed on a salaried basis by groups of the general public. Addressing the National Physicians Committee on Nov. 27, Dr. Morris Fishbein, editor of the *Journal of the American Medical Association*, said: "It is well within the desire and ability of American medicine to develop for the American worker plans for the provision of medical care which will be democratic in their conception and in their functioning and which need not serve necessarily as the basis for destruction of the American way of living."

In the main, existing prepayment services have been built up by individual industrial concerns. Entry, which is generally voluntary, is usually confined to workers earning less than $3000 (say £600) a year. Some services cover workers only; others provide medical care for dependants. Some offer a complete service including home doctor, specialist, and hospital; others offer only a partial service, perhaps with a measure of cash assistance towards the cost of non-provided treatments. The doctors are as a rule paid on a fee-for-service basis, though in a few cases they get a salary. Free choice within a list of coöperating practitioners is the rule. The disadvantage of organising a health service on a factory basis, in a country where industrial conditions fluctuate violently, is recognised by the establishment of the Michigan and Massachusetts State prepayment programmes. Michigan already has a membership of over 600,000, while in a year and a half Massachusetts has enrolled over 34,000 people. Weekly premiums vary not only from scheme to scheme but inside each scheme on a basis of current disbursements. A further variation is introduced since some schemes relate weekly premiums to incomes. The annual cost per person eligible seems to range from about $17 to $22 (£4 5*s*. to £5 10*s*.), giving an average contribution of something under 2*s*. a week, or 10*s*. a week for a man and wife with three children. Since contributions fluctuate with the total use made of the service, there is an incentive, albeit rather indirect, for the individual patient to confine his demands for medical treatment to essentials. A whole-time medical director is usually responsible for seeing that the doctors, for their part, do not carry out unnecessary treatment for the sake of the fees.

An attractive feature of American prepayment plans is that their management is usually in the hands of a joint committee, with the majority of its members elected by subscribers, and the minority by the participating doctors. Thus the two parties are encouraged to work together for the common good. The indigent poor are generally regarded as a reasonable charge on the community as a whole, through taxation.

A constructive addition to the story is provided by a report on the Principles of a Nation-wide Health Programme,[2] produced by a joint committee of doctors, medical administrators, and economists, among whose members are Solomon Bloom, Hugh Cabot, John Peters, and Kingsley Roberts. Their main recommendations are compulsory contributory insurance, payments related to earnings, free choice of attendance by patient and doctor, joint administration by doctors and consumers' representatives, and payment on a fee-for-work, capitation, or salaried basis, the decision to be made by the majority vote of the local doctors. At present, according to a nation-wide survey conducted by the National Opinion Research Centre of the University of Denver,[3] 34% of people have some insurance helping to meet hospital bills, while 14% have some insurance helping to cover doctors' bills; 31% admit having been put off seeing a doctor because of the cost, 68% favour a social security plan covering medical services, and 82% think something should be done for people to get the medical care they need. The difference between the two last figures is accounted for by a minority who favour private insurance schemes.

THE CHILD WITH A CRIPPLED HEART

THE discussions accompanying the passage to the Statute Book of the new Education Act have brought to the fore the question of the education of our physically defective children. Some indication of how Chicago tackles the problem is given in a report [4] on 20 years' experience at a special school in that city for children with various physical defects. This report is concerned only with the children with cardiac lesions. It is based on 233 cases, of whom 130 had been re-examined just before the report was written, and 56 were known to have died since they left the school. Of the 233 children 85% had rheumatic heart disease and 9·4% congenital lesions. The average age at entrance to the school was 12 years. The families from which the children came were rather large, on the average, most of them consisting of four or five children. Their socio-economic status was good in 38%, fair in 39%, and poor in 23%, the school being situated in one of the poorest districts of Chicago. The 130 children whom it was possible to re-examine were equally divided between the sexes, and at the time of re-examination ranged in age from 17 to 33 years. Of the women, 32 were married, 14 had one child, 3 had two children, 1 had three children, 2 had had four pregnancies, and 3 were pregnant. In no case was there any evidence that the heart lesion had adversely affected either pregnancy or labour. Recurrences of rheumatic fever since leaving the school were reported in 20% of this group. The cardiac status of 104 of the 130 had either improved or remained the same since they left. Only 5 members of this group had never worked or were not working at the time of re-examination. The jobs they were doing were most varied, including such exclusively American ones as "26 girl," "subway mucker," and "candy packer," while their recreational activities ranged from sewing to basket-ball, speed-boating, and hunting. In assessing the significance of the mortality-rate—26% in the 233 cases—it has to be borne in mind that admission to the school depended on whether the child "by reason of disease, accident, or congenital deformity cannot attend a regular school with safety and profit"; in other words, only the severer cases of heart disease were admitted.

With notable exceptions, such as the London County Council, we in this country have been behindhand in

1. *J. Amer. med. Ass.* 1944, **126**, 331–348.

2. Committee on Research in Medical Economics, 1790 Broadway, New York. November, 1944. 10 cents.
3. What do the American people think about Federal Health Insurance? University of Denver, 1944. 50 cents.
4. Kohen, K. H., McEldowney, R. P. *Amer. Heart J.* 1944, **28**, 491.

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our provisions for the rheumatic child. Too often these unfortunate children have been allowed to spend their lives wandering in and out of hospital, "interesting cases" for the student but neglected as human beings with the hopes and aspirations of youth. It is practically a decade since Ritchie [5] pointed out that "the onus of instructing the people, local authorities, and the State regarding health measures rests upon the medical profession, which has therefore the bounden duty of advising the community regarding the measures that ought to be taken to curtail the scourge of acute rheumatism. Now is a propitious time for that advice to be given." Perhaps Mr. Butler will be able to ensure that in the new educational era on which we are entering the cardiac cripple will not lack schooling.

NITROGEN BALANCE IN BURNS

THE loss of nitrogen by exudation from burnt surface has now been carefully studied. Hirshfeld and his associates [6] collected the exudate in a special dressing woven from fine glass fibres ('Fibreglass') and found that in 6 patients this accounted for 3–25% of the total nitrogen output. Co Tui and his co-workers [7] collected the exudate from two burnt patients and estimated that they lost 0·42 mg. and 2·26 mg. of nitrogen from each square centimetre in 24 hours. Taylor [8] points out that there is a well-marked tendency to a negative nitrogen balance in burnt patients because increased urinary output of nitrogen, loss of nitrogen in the exudate, increased demands of nitrogen by healing tissues, and increased requirements due to infection all accompany the body's attempts at recovery. The maintenance of a positive nitrogen balance is thus of fundamental importance, but these workers all agree that it is also extremely difficult. Various methods can be used, such as high-protein diets, which alone do not seem to suffice, or intravenous infusions of plasma, which may be difficult to maintain long enough. Co Tui and his associates believe in the administration of amino-acids, and refer enthusiastically to a substance they call 'Amigen' though they do not reveal its nature. Levenson [9] concentrates on limiting the loss of exudates from the burnt areas and advocates pressure dressings with splints or close-fitting casts, without preliminary cleansing. He insists that the pressure dressing should be applied as early as possible, that it should extend well beyond the burnt area and always to the end of an extremity, and that the pressure must be even. The perfecting of chemotherapy and our organisation for the efficient first-aid treatment of shock, and the recognition that the burnt patient requires a greatly increased nitrogen intake together seem likely to make the outlook for the severely burnt patient far less dismal.

PUNISHMENT FOR ILLNESS

FOLLOWING strong recommendations by the Surgeon-General US Army, the subcommittee on venereal diseases of the National Research Council, and other eminent authorities, the government of the United States have repealed an Act of 1926 whereby personnel of the navy and army absent from duty on account of the direct effects of venereal disease due to misconduct were subjected to penalties involving forfeiture of pay.[10] The new legislation abolishes all punishment for venereal disease, which is now defined as having been acquired "in line of duty" instead of as formerly "due to wilful misconduct," provided that there has been no attempt at concealment and that at the time of infection the sailor or soldier was not an absentee or a deserter. The statute also provides that, with the same exceptions, any disability ensuing may be regarded as attributable to service as regards pension and compensation benefits.

The acquisition of venereal disease has never been penalised per se in the British armed forces, but all cases of illness or disability due to the patient's own fault, necessitating hospital treatment, are liable for hospital charges, which among non-commissioned ranks amount to eighteen pence a day. If this rule was enforced a man who broke his leg in a motor-cycle accident on an illegal or unauthorised journey would have to pay 1*s.* 6*d.* a day towards his hospital treatment, in common with men suffering from venereal disease acquired by illicit intercourse. But recently in the case of VD it has been recognised that this might lead to concealment, and the Army and Royal Air Force now follow long-standing naval practice whereby no charges are levied for the first thirty days of hospital treatment for venereal disease, those after that time being at the reduced rate of 10*d.* a day. With modern treatment, a stay of longer than thirty days in hospital is very rare, but it is difficult to understand the reason for what is in effect the punishment of those who fail to respond to treatment. It is understood that the medical authorities of our three Services are unanimously in favour of abolishing every vestige of penalisation, retaining of course the present punishment for concealment. But belief in the eleventh commandment—Thou shalt not be found out—dies hard.

TREATMENT OF ALCOHOLISM

IN a report lately published [1] in New York by the Research Council on Problems of Alcohol, Corwin and Cunningham argue that the primary responsibility for the treatment of alcoholism should be undertaken by general hospitals, the present-day tendency to do away with special hospitals being extended to institutions for alcoholism. Yet alcoholics are often trying patients and their numbers in America seem to be relatively large. The general hospital, therefore, for most of them would act only as a clearing station, whence each patient would be drafted to the sort of employment or specialised institution judged most suitable to his type of inebriety. The promotion of clinics for addicts in outpatient departments of hospitals is advocated in connexion with this scheme. More would be required than "jaunty sobering-up treatment," which is said to be the present limit of interest shown in alcoholics by general hospitals. But a great number of psychopathic alcoholics do not wish to abstain, and for them the recommendations of the report would be useless. The only way to deal with this group, the authors suggest, is by various compulsory measures, which would involve legislation; but in England the history of the Inebriates Acts has shown how futile such legislation becomes in practice. The facilities for treatment of alcoholics in pre-war England, France, Germany, Russia, Sweden, and Switzerland are adjudged inadequate. In Germany the Nazis have abolished previously existing institutions and content themselves with sterilising "hopeless inebriates," hoping they will then drink themselves to death as quickly as possible. In other countries, where facilities are better, alcoholics fail to take full advantage of what is available. Hence again the need for compulsion, though the ills arising from attempted prohibition are admitted. In Russia all alcoholics are said to be registered and to be kept under the direction of "specialists in narcology." A questionaire, addressed by the Michigan State Hospital Commission to authorities in 47 states, and to 23 acknowledged experts, asked whether alcoholics should be treated in a separate institution; 41 replies out of 52 said yes, and 11 said no. Of 56 replying to other questions all favoured a rural rather than an urban site

5. Ritchie, W. T. *Brit. med. J.* 1936, i, 679.
6. Hirshfeld, J. W., Williams, H. H., Abbott, W. E., Heller, C. G. Pilling, M. A. *Surgery*, 1944, **15**, 766.
7. Co Tui, Wright, A. M., Mullholland, J. H., Barcham, I., Breed, E. S. *Ann. Surg.* 1944, **119**, 815.
8. Taylor, F. H. L. *J. industr. Hyg.* 1944, **26**, 152.
9. Levenson, S. M. *Ibid*, p. 156.
10. Editorial, *J. Amer. med. Ass.* 1944, **126**, 632.

1. Institutional Facilities for the Treatment of Alcoholism. E. H. L. Corwin, Elizabeth V. Cunningham. New York: Research Council on Problems of Alcohol. Rep. no. 7. Pp. 85.

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for the institution, and 53 were in favour of legal means of detention. The length of legal detention advocated varied; a large majority favoured an indeterminate period and the bias is towards long rather than short terms. The report's leaning towards compulsion is unlikely to be regarded favourably in this country. Yet our great voluntary hospitals might consider the plea that they should act as the first line of attack on alcoholism. The emphasis of the report is on the inadequacy of hospital facilities for treatment, but it commends the educational and preventive work being carried out by temperance and other social service societies.

MEDICAL OFFICERS OF HEALTH ON THE WHITE-PAPER

THE council of the Society of Medical Officers of Health, having considered the Government's proposals for a National Health Service, have issued a report declaring that provision of hospital services has been diligently pursued by local authorities since 1930 and it would be "extremely unfortunate if the progress of this work were disturbed by transferring these services from the major local authorities to joint boards and disrupting their necessary relationships with the other health services of local authorities." The society recommends:

(1) That the medical and health functions of various Government departments be brought within one central Health Ministry with a Cabinet Minister as the responsible head.

(2) That, pending the formation of suitable local-government units, area hospital councils be established to advise the hospital authorities and the Minister as to the distribution of hospitals in the areas, and that such additional hospital accommodation as may be required be provided and maintained by existing hospital authorities, municipal or voluntary, singly or jointly, as may be necessary, in accordance with the plan as approved by the Minister.

(3) That as soon as possible the necessary steps be taken to resolve the chaos of local-government administration, special consideration being given to the needs of Greater London.

It is suggested that in any local-government area there should be a single authority for health purposes and that the extended health services should be administered, in the larger local-government areas required, by elected bodies responsible for the other services of local government.

PENICILLIN IN EYE INFECTIONS

OF the organisms commonly causing eye infections the most sensitive to penicillin are the hæmolytic streptococcus, the gonococcus, and some strains of staphylococcus. *Streptococcus viridans* and the pneumococcus are less sensitive, and staphylococci vary from extreme sensitivity to extreme resistance. It is now two years since penicillin was first used clinically as a local application to the eye and to judge from reports so far published it seems doubtful if our expectations of its usefulness in external eye disease will be realised. All agree that it is now the treatment of choice in gonococcal ophthalmia neonatorum, being an improvement on sulphapyridine for this condition, and it has also proved remarkably successful in clearing up chronic ulcerative blepharitis, hitherto a most disfiguring and resistant disease. Varied results have attended its use in catarrhal and mucopurulent conjunctivitis other than gonococcal, and in the treatment of corneal ulcer, and Keyes [1] finds that there is not much to choose between penicillin and sulphathiazole for these infections. Penicillin has been used in strengths ranging from 250 to 10,000 units per c.cm. of normal saline, the usual strength in this country being 500 Oxford units to the c.cm. If used in the form of drops the penicillin must be instilled every half-hour for acute infections, and this in itself is a handicap to its universal use. If kept at room temperature, the drops lose much of their effectiveness in 48 hours and they should therefore be kept in a refrigerator. On the eyelids penicillin ointment is useful and Keyes used 25% hydrous wool fat and 75% cold cream as a base, one gramme of ointment containing 500 units of penicillin. Neely and Cross describe in this issue a penicillin lamella, each lamella containing 100 units. The lamellæ have the advantage that they do not degenerate at room temperature and preserve their potency for a long time, being thus especially useful for Service conditions. For acute iritis due to the gonococcus there seems no doubt that penicillin given intramuscularly by injection or by drip is effective, and it is also recommended as an irrigation for the anterior chamber of the eye in severe infections and war wounds. Cashell [2] irrigated the anterior chamber in 2 cases of perforating injury with good results.

1. Keyes J. E. L. *J. Amer. med. Ass.* 1944, **126**, 610.

NEGOTIATIONS OPEN

NEGOTIATIONS between the Government and the medical profession on the proposals for a National Health Service opened on Friday of last week, when Mr. Henry Willink (Minister of Health) and Mr. J. Westwood (joint parliamentary under-secretary for Scotland), met the Negotiating Committee appointed by professional bodies. The committee has 31 members, 16 being appointed by the British Medical Association, 3 by the Royal College of Physicians of London, 3 by the Royal College of Surgeons of England, 3 by the Scottish Royal Medical Corporations, 2 by the Royal College of Obstetricians and Gynæcologists, 2 by the Society of Medical Officers of Health, and 1 each by the Society of Apothecaries of London and the Medical Women's Federation.

THE President of the United States has awarded the military decoration of the Legion of Merit to Major-General Sir ERNEST COWELL, FRCS, "for exceptionally meritorious conduct in the performance of outstanding services from September, 1942, to March, 1944," as director of medical services at Allied Headquarters in the Mediterranean. General Cowell was responsible for the medical services of the forces landing in North Africa, Sicily and Africa. He "welded together the medical services of the American and British forces and produced a highly successful organisation which resulted in the saving of many lives and contributed to the well-being and comfort of the sick and wounded of both nations."

Sir THOMAS BARLOW, FRS, consulting physician to University College Hospital and to the Hospital for Sick Children, Great Ormond Street, died in London on Jan. 12. He was in his 100th year.

2. Cashell, G. T. W. *Brit. med. J.* 1944, i, 420.

VOLUNTEERS FOR RELIEF WORK.—The Minister of Health (Circular 1/45) considers it right that medical officers of local authorities who are anxious to volunteer for relief work abroad should be given the chance to do so, though he stresses that the needs of public health in our own country must not be overlooked. Volunteers for posts under UNRRA, or with the voluntary societies who are members of the Council of British Societies for Relief Abroad, should therefore obtain the consent of their local authority before making application through the appointments offices of the Ministry of Labour and National Service. This preliminary assent will not, however, bind the local authority to release the applicant, and the authority will be consulted again before the officer is actually engaged. The Minister has recognised relief work undertaken in accordance with these arrangements as war service for the purposes of the Local Government Staffs (War Service) Act 1939.

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Special Articles

TECHNIQUE FOR SURGICAL PHOTOGRAPHY

B. RICHARDSON BILLINGS, MRCS, ARPS

THESE notes set out the result of experiments with apparatus I have found useful in clinical photography, particularly in photography of surgical operations under aseptic conditions. The outfit is sufficiently portable to be used in ward or casualty department, and even has uses other than clinical.

The first essential is a suitable tripod. The base of this is heavy and each corner is castored (fig. 1); from this a standard rises perpendicularly, adjustable and graduated in inches; it supports at its upper end a horizontal tube (A) on which is clamped the baseboard. This simple construction gives adjustment to the baseboard (B) movable in three planes, a single nut controlling each plane: in other words, we have the much desired "universal movement." On the baseboard slides a sub-baseboard (C) to which is affixed the camera itself. This sliding movement is one of the factors governing eventual focus and size of picture. The sub-baseboard can be fixed in any selected position.

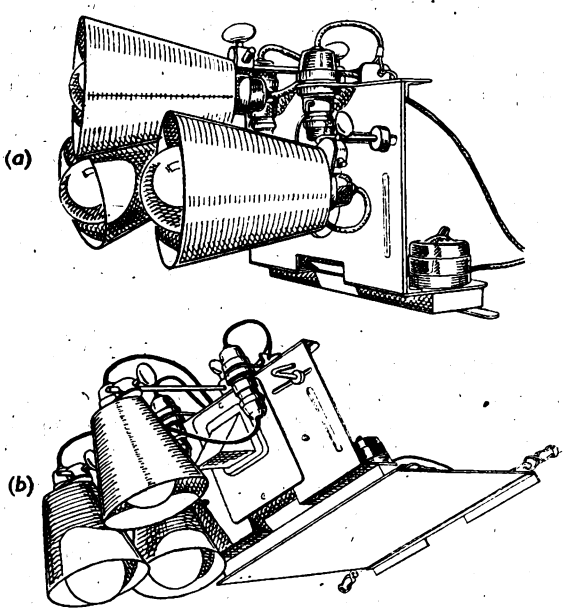

Fig. 2—(a) arrangement for "straight-through" subjects; (b) underview of sterilisable plate for operation subjects.

The front of the baseboard carries—again by a single fixing wing-nut—the head, comprising illuminant and reflector.

Illumination comes from two or more shaded 'Photoflood' bulbs mounted in chosen positions round a form of lens hood (fig. 2a). The bulbs are wired in series-shunt fashion controlled by two switches, one on either side of the base, so that one or both bulbs can be used, either at half or full strength. In addition there is a central removable shaded incandescent lamp; this was found useful for focusing, since even at half power the photofloods give out too much heat to be comfortable if left on longer than the time required for the actual exposure, especially with ciné shots. Moreover, this pilot light prolongs the life of the photofloods. These can be fixed one on either side or both on the same side, and swivelled or rotated through any angle between vertical and horizontal, so fitting the needs of all conditions likely to be met. A further considerable advantage is that this part of the head may be used as a supplementary switchboard when photographing subjects at a distance from the camera.

The reflector is the crux of the idea: a mirror is housed in a removable metal hood at an angle of 45° to the optical axis of the camera, and this is always used except when photographing subjects in line with the optical axis. The principle is the same as in the laryngoscope and presents a "surgeon's-eye view" of the field of operation. It thus eliminates the distortion and foreshortening inevitable with the camera at any other angle or at any other distance, with or without a telephoto lens.

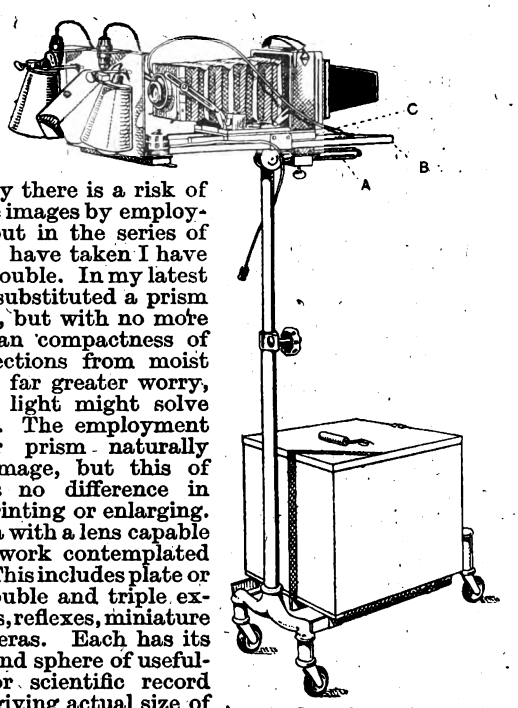

Fig. 1—General arrangement: (A) horizontal arm carrying (B) baseboard, lamps and reflectors. (C) sub-base board which carries the camera.

Theoretically there is a risk of getting double images by employing mirrors, but in the series of photographs I have taken I have not met this trouble. In my latest model I have substituted a prism for the mirror, but with no more advantage than compactness of design. Reflections from moist surfaces are a far greater worry, but polarised light might solve this difficulty. The employment of mirror or prism naturally inverts the image, but this of course makes no difference in subsequent printing or enlarging.

Any camera with a lens capable of doing the work contemplated can be used. This includes plate or film types, double and triple extension models, reflexes, miniature and ciné cameras. Each has its own domain and sphere of usefulness. But for scientific record photographs giving actual size of subject are preferable. Whatever the camera, focusing must be critical and all aids to this end should be employed.

The whole head, with bulbs, switches, wires, hood and mirror, is detachable from the baseboard as a single unit. When not in use it is kept in a metal airtight chamber containing formalin vapour, which is considered to sterilise it sufficiently. When about to be used, the head is lifted with sterilised tongs from the cabinet and fixed to the baseboard by its nut. Underneath the head a large flat metal plate can be clipped on (fig. 2b); this plate is boiled before the operation and fixed in position by one of the "clean" theatre assistants who uses a pair of ordinary towel clips to lock it in place. The front and underpart of the apparatus, which comes over the operating table, can thus be regarded as sterile; the photographer's terrain (i.e., behind and on top) is guarded from that of the surgeon.

Most of the details can be settled beforehand, so that when the surgeon is ready for the photograph it takes the photographer only a minute or less to wheel the camera into position on either side of the table, focus, light up and press the button; then the camera is wheeled out of the way. Teamwork scores.

For the photography of pathological specimens, copying charts and the like, an adjustable easel is added vertically below the mirror, which helps to standardise the work (fig. 3). The easel is a flanged frame with a plain glass bottom. The lights are brought down on to adjustable lamp-brackets to illuminate the specimen laid on the glass, below which, at a suitable distance, is a white background—a towel suffices. This gives a shadowless field. A washable celluloid footrule should be included in the picture.

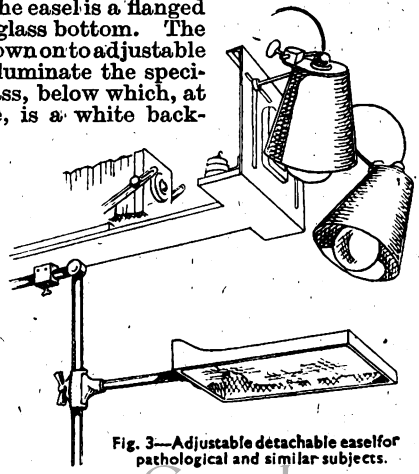

Fig. 3—Adjustable detachable easel for pathological and similar subjects.

Basic data of sensitive material, wattage, exposure, aperture and directions for the more orthodox "straight" clinical photography are outside the purpose

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of these notes; they are as varied as the scope of the apparatus. I hope I may have stimulated medical photographers to take up this promising side of scientific record, and manufacturers to give us the tools with which to do the job.

I am indebted to Mr. Kenneth Heritage, FRCS, senior surgeon at St. John's Hospital, Lewisham, for his coöperation and for his permission to try this apparatus over his table.

HOSPITAL FOOD

II. WHAT IS GOOD FEEDING?

"The Cure of disease by means of diet is the most wonderful part of medicine."—CELSUS AD 30.

"Now good digestion wait on appetite and health on both."—SHAKESPEARE.

"All nutrition work, to be worthy of our present knowledge and opportunity, must stand four square upon equal recognition of calories, protein, mineral elements, and vitamins."—H. C. SHERMAN (1925).

"A dietary standard is an indication, not a rule."—ATWATER.

ENGLISH food has not always been a standing joke among foreigners. Our forebears ate handsomely, priding themselves on the variety of their dishes, and their ingenuity in seasoning them. The Normans brought their own cooking tradition with them; the Elizabethans were connoisseurs of the dressing of meat, game, and poultry, and their enthusiasm for the decorative trimmings of a meal gave us the good word "kickshaws." Even the Victorians ate solidly and well, and before the industrial revolution drove people into the slums of towns, cottagers' wives were cooks as notable as those still found in Scottish crofts. Our falling off in standards dates, it seems, from the last century, when many people became too poor to buy either good food or the equipment and fuel to cook it well. Cooking is an art handed from mother to daughter, and once the chain is broken it is hard to make a new beginning.

But if women have lost some of their pride in cooking, men have remained keen amateurs of good food; and when times become more normal could do much by judicious grumbling to raise the national standard. The workman's wife, for lack of means and training, may never become a fine or fancy cook, but in the interests of domestic peace she normally learns not to spoil the dishes she does tackle; and for this reason, among many others, hospital patients are particularly annoyed by the sight of good food wasted by bad cooking. They may be ignorant about dietetics, and chary of trying unusual foods, but this does not mean, as is sometimes alleged, that they are "not particular about what they eat." Within the range of foods they know they are exceedingly particular. And if they are to be introduced to new foods or methods of cooking these must be presented with first-class technique so as to overcome their initial prejudice against the unknown.

Assuming, then, that hospital patients take a serious critical interest in their food, how can we be sure of feeding them well?

FIRST BUY YOUR FOOD

The scientist approaches the subject of good feeding by experiment and calculation, and estimates the standard needs of people of different sex, age-group, and occupation. These he interprets in terms of food values. The caterer, on the other hand, may be chiefly concerned to produce meals which appear attractive, but unless he or she knows something of dietetics these meals may be unbalanced and incomplete.

If feeding was designed for a machine, the scientist's approach would be the one and only way to give satisfactory results; but good feeding for live men and women is a different problem. Each has his likes and dislikes and his choice of food is influenced by habit and custom, by the food's appearance and palatability, and the surroundings in which he takes it. The hospital ought to combine the scientist's knowledge of good feeding, with the caterer's art of producing appetising meals.

First the food must be bought. This is the caterer's job, and he or she can lose the fight in the first round by doing it badly. It is a mistake to make long-term contracts with firms, or to have a rigid system of buying. The caterer, like the good housewife, must have his eye on the market and buy what is good today. The best, from the hospital point of view, is not necessarily the most expensive. When cherries are plentiful they are cheap, and those at either the top or the bottom price can usually be ignored in favour of those at the average price of the market. Fruits like these, which are only in season for a short time, can be given often without provoking a charge of monotony: most people are glad to eat cherries freely while they can get them. Fish also should be bought with a weather eye on the market. The steamed cod of hospital tradition should be only one item in a repertoire of fish. Cod's roes, herring's roes, and sweetbreads are sometimes to be snapped up, for the patient on a high-protein diet. Apples—in war-time no longer perennial—should be exploited fully while they are in season, especially with the coöperation of the pastry-cook; apple-pie is almost universally favoured. The caterer must have as keen a nose for a fresh food in the market as a good reporter for news; this bloodhound quality can keep the whole hospital, staff and patients alike, curious about the next meal—an excellent mood for appetite.

But he must not only buy various foods—he must buy enough of them. This fundamental obligation, strangely enough, is one in which he quite often fails, usually because the hospital committee has not been able to free itself of too great a concern for economy in the kitchens. Before the war, perhaps, it was not always easy to say what was "enough" food: but nowadays, thanks to Lord Woolton and his collaborators, we have a yardstick. Rations represent roughly our basic dietetic needs. If a man is getting those, though he may not be overfed, he is not going short. This carries the corollary that if he is not getting his rations, or getting only part of them, he *is* going short. Yet it is the custom in many hospitals not to draw the full rations for patients—presumably because the full rations exceed the quantities of food which these hospitals were buying before the war. The inference is obvious, and so is the moral. The rations must be bought in full if patients are to be properly fed.

THE COOK'S PART

When enough good food has been bought, checked, and properly stored, it must be cooked; and those responsible for cooking should have some principles in mind: meals should tempt the appetite and please the palate; they should satisfy hunger, and be digestible; and they should be nutritionally adequate. Meals will tempt the appetite only if menus are properly planned, and if the preparation, cooking, and service of the food are well thought out. There must be no monotony, lest the patient loses interest, and with it appetite. If the food itself is varied it is not difficult to plan well. Variety should be introduced:

Weekly.—The meals on one day of the week should never be reproduced on the same day in the following week. It should no longer be possible to hear a patient recall a special day of a week because he had a certain dish on that day.

Daily.—The same dishes should not be served on two consecutive days; and there should be no similarity between two meals on the same day.

By studying consistence.—Mastication is important. A meal should not, except in special cases, consist of two soft dishes, such as mince followed by rice pudding.

By offering a choice.—No patient should go hungry because he does not like the dish of the day.

By considering the æsthetic sense.—A nice-looking plate of food stimulates gastric secretion, and hence promotes digestion. Colour can be introduced by the use of garnishes.

APPETITE

Appetite varies with different people. In hospitals two different groups of people must be catered for: one group is the staff, who are well, active, and hungry; the other the patients having "full diet," and those who are convalescent, and whose weight is being built up. The first group need bulky meals to satisfy their hunger, whereas the second group often require a high concentration in small bulk. Menus therefore must be planned to suit the type of person to be catered for.

Patients should get enough to maintain good nutrition. Loss of weight in hospitals is all too common, even in tuberculous patients awaiting admission to sanatorium. Meals must, of course, be planned to contain proteins,

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carbohydrates, fats, mineral salts, and vitamins in proper balance; and in order to achieve this it is almost essential to give three cooked meals in the day. But since the patient—especially the patient in bed—cannot digest the same type of meal as the healthy person who is leading an energetic life, the food chosen must be light, not stodgy. Food should be cooked sufficiently—not overcooked—and properly seasoned. The cook who lets dishes leave her kitchen without tasting them—or even smelling them (thus allowing food which has "gone off" to reach the patients)—is helping to maintain the bad reputation of "institutional meals." Soups should be varied; for example lentil soup and potato soup are not seen often enough in most hospitals, except by private patients. Brown vegetable soup is often a tedious routine.

Sauces for fish and vegetables give flavour and relish, and vegetables must never be watery and overcooked. At present, when citrus fruits are almost unobtainable and the vitamin C in the diet is largely derived from home-grown vegetables, special care should be given to the cooking of vegetables, and to the time they spend in the pot or on the hot-plate. It is not good cooking to prepare and boil the vegetables early in the morning so that they are ready to serve at 10.30 AM, and to keep them in a hot closet until lunch-time.

ELEGANT AND SMOKING HOT

Patients are tempted by food which looks attractive—true and trite. And not only patients: when the Sunday joint comes to table, all set about with bread sauce, gravy, and baked potatoes, the fine smell and the sight of the carving knife slipping lightly through it puts the family's gastric mucosa on its mettle.

Unfortunately in hospital the intimacies of the dining-table cannot easily be reproduced, and it is necessary to think of substitutes for this particular stimulus to appetite. One way is to present the food on a dish of appropriate shape and colour, and to garnish it agreeably; but this refinement is partly wasted if the patient has no chance to see it before it is served. Separate tarts or moulds often have more appeal than portions served from a large tart or mould. Salads should be served on separate plates, one for each patient, and if made dishes can be put into small separate pie-dishes so much the better. Finally, the food must be served with an eye for each patient's likes and dislikes; and this is the special province of the ward sister. If the patient in bed 5 is a clerk, perhaps rather fussy about his food, then she must be fussy too. If his neighbour in bed 6 is a hungry navvy, he must have the loaded plate his stomach craves. To most patients however, it is better to give a little, neatly served, and to make sure that they are offered second helpings. A nurse can take the trolley round and offer more to every patient, with a little personal encouragement for each.

Besides being pleasant to look at, food described as hot must be hot, and food described as cold must be cold. Tepid dishes have had no success in tempting the appetite of the sick.

CANADA

FROM OUR OWN CORRESPONDENT

IN considering applications for certification as specialists, the Royal College of Physicians and Surgeons of Canada has displayed a lenient attitude towards senior men who have been practising specialties but who have not acquired special diplomas; but it is less ready to register without examination the many applicants who are within a few years of graduation. Examining boards are not yet set up but it will not be long before they are established. The time has come to insist that the would-be specialist has taken pains to acquire a special skill.

The fellowship itself should be the best evidence of proficiency in general surgery, medicine, or obstetrics. At the recent annual meeting 10 fellowships were awarded *ad eundem*, 5 on passing the final examinations under the old regulations, and 5 on passing the regular tests. This is not the evidence of vigorous growth that friends of the college would like to see. Ten fellowships obtained by passing examinations is too small a number for any year. Opportunities for postgraduate study are increasing in Canada, and it might be expected that the fellowship would be a coveted reward.

In England Now

A Running Commentary by Peripatetic Correspondents

ON returning to the tropics after an interval of eight years, I was surprised at the change in the attitude of most Europeans to the sun. Formerly in Central and East Africa it was generally believed that to go out of doors without a topee before 4 PM—even on a cool or pouring wet day—was to court sudden death or at least serious mental derangement. Topees were also de rigueur inside tents, cars, and even buildings of insufficiently robust construction. The danger was thought to be not from heat but from some special "rays" only found in the tropics. Some few people, medical officers and others, questioned this view, but they were looked on as dangerous revolutionaries. There was indeed one senior official who had carried out his duties for many years with unusual drive and efficiency but seldom wore a hat, and he was sometimes cited by the newcomer in disproof of current theories. However, this did not defeat the old stager, who would say that although Dr. X *seemed* quite healthy, he was in fact very abnormal. When asked in what ways these abnormalities manifested themselves (for Dr. X seemed to be the sanest of men) the old stager would say: "He does all sorts of queer things—for instance, he goes out without a topee." Nowadays it is comparatively rare to see a topee being worn by a European, this type of headgear being almost entirely restricted to native clerks. Nevertheless the general health of European residents and of troops is probably better than ever before. The newcomer to the tropics is well advised to treat the sun with reasonable respect, but the difference between the radiation in tropical and temperate regions is clearly quantitative and not qualitative.

* * *

Another examination has come and gone, and as an examiner my first reaction is one of sympathy for the London student and his teachers. I surmise that work has been much disturbed by the flying bombs, and that clinical material is still appreciably restricted. Moreover, clinical teachers all over the country are tired and overworked, and steady leisurely teaching must be almost impossible. All too often the Finals candidate is at sea about fundamentals. Observation of simple clinical happenings is surprisingly at fault; the alæ nasi of the bronchopneumonic child are not noticed, Cheyne-Stokes breathing goes unrecognised, the heaving pulsation of an obvious aneurysm is not felt by the palpating hand. Cardiac murmurs are not timed, or if they are timed, more often than not they are wrongly and indeed impossibly placed. Physical signs in the chest are more than ever a mystery. As a result many Final MB candidates show themselves little less immature than students doing their terms of clinical clerking.

The vast majority of candidates seem never to carry out for themselves any clinic-room investigations. Practical familiarity with urine testing hardly exists. No doubt the sending of specimens to the clinical laboratory for report has relieved the student of any feeling of responsibility for making investigations of his own. "The presence of pus is made more certain," wrote one candidate in answer to a question on the white-cell count, "*by the return* (my italics) of a white-count of 25,000." This student is evidently not thinking of ever doing his own blood-counts!

One of my peripatetic colleagues has previously commented on the widespread inability to spell. Here are some mistakes which I noted in this examination: tubucolosis, classiffication, psycosis, infalable, falaceous, dillusional, vommiting, insensative, distroyed; "a dirty hurd of cows"; "the embryo burroughs its way through the intestinal wall and reaches the liver" (where presumably it receives a cold wellcome). I notice a surprising increase in the use of abbreviations, even to the extent of writing R for "treatment," and D for "diagnosis." The student should remember that even though life is short and the art fleeting, the poor ignoramus of an examiner may be unable to interpret his cryptic letters. EOM, for example, stumped me completely: I could think only of "external orditory meatus," which in the context seemed inappropriate. Hedging and ditching are always with us. The student seems terrified to commit himself. "In

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acute cholecystitis, there may be pain": "prolonged boiling of milk tends to destroy vitamin C": "acute bacillary dysentery may be accompanied by diarrhœa."

One or two outstanding delights were noted. Discussing the diagnosis between the coma of drunkenness and that due to illness, one candidate wrote "The breath may smell of stale alcohol. A smell of fresh alcohol may indicate that the man may have felt ill before becoming unconscious, and took a little alcohol beforehand"—a useful fellow, this, for a police surgeon's job. Another suggested that "the patient must be red-educated" ("in Moscow, I presume," commented my co-examiner). "The large cyst," wrote another, "forms many daughter tæniæ which are called scolioses." One student thought that dogs deposited ova of *T. echinococcus* via the urine on to lamp-posts, from which the human being got his infection.

In the clinical part of the examination, many students are like those witnesses in court who have a story to tell and who are determined to tell it in all its details and irrelevancies. They waste precious minutes of the all-too-short time which the examiner wishes to use for finding out what the student knows and so help him to get through to qualification. "Just give me the salient facts about this patient, and don't worry about the things that do not matter," says the examiner: but the candidate pores over his little sheet of notes and explains that the patient has yellow hair, lives at Putney, does her washing on Tuesdays because her daughter from Twickenham leaves the baby with her on Mondays, and seven years ago scratched her right arm when she was blackberrying in the country. You understand this urge to get the story right in every detail, and you sympathise: nevertheless, you wonder whether your examinee can assess the important facts in the history and in the examination of the patient

To those who have anything to do with the preparation of the student for his Final, I would give this advice:

(1) For some weeks before the examination, take him often to the bedside and make sure that he can observe and examine a patient. Students do not fail because they cannot localise a cerebral tumour or detect the passing of a benign hypertension into the malignant hypertensive phase. They come down because they miss a gross falling in of one side of the chest or a dextrocardia due to fibrosis of the lung; because they cannot detect an obviously enlarged liver or spleen, or time an easy cardiac murmur, or feel a well-marked collapsing pulse. A student who shows that he understands the significance of the history and symptoms of the case and can elicit correctly the physical signs is likely to do well even when he fails to make a clear-cut diagnosis.

(2) Make sure that the student has practical experience of the usual side-room investigations. The examiner in a qualifying examination is much more interested in whether the student has a working knowledge of albuminuria or glycosuria, whether he is aware of the practical snags which may arise, than in what he knows theoretically about the van den Bergh reaction or the electroencephalogram. He feels that the student ought to be familiar with the appearances of sputum in the sputum cup, or with elementary observations and tests on the fæces.

(3) Reassure the student that examiners are cheered up when they meet any evidences of "clinical nous"—for example, if in discussing a patient the candidate picks out the four or five salient points in the history, or links up the absence of a presystolic murmur with auricular fibrillation.

* * *

Pongo-Pongo is not the only place demanding intermittent or preferably regular indulgence in alcohol for the maintenance of reasonable health and a temper of workable equability. The steamy heat of Beira in Portuguese East Africa requires a litre or two of light Danish lager at midday and some five or six double whiskies after sundown. When I was there I asked a Portuguese colleague why this should be so. He was a brilliant if daring surgeon who once excised a kidney on board ship with no more tools than the ship's butcher could provide. Years later, to his extreme surprise, he met his patient sturdily tramping the streets of Capetown. On this alcohol question he agreed there was no special nutritive or medicinal quality in alcohol likely to account for the facts. He thought its effect on the mind was the important factor. "We live here in a little group," he explained, "we meet the same few people and see the same faces every day and we are bored. The night dose of alcohol releases the inhibitions just enough to make us pleasant company and so helps to maintain a good mental tone. Nothing encourages the invading germ like low mental tone." Our discussion took place over a glass after the funeral of the manager of a local shipping firm. The firm's proprietor was a staunch teetotaller and insisted that his managers should be teetotallers too. His Beira branch—the only one in the tropics—had the reputation of being the unluckiest branch in the firm. "In this country," said my Portuguese friend, "teetotallers die first and drunkards next, but the moderate drinker often lives to a good age."

On Active Service

CASUALTIES

DIED OF WOUNDS

Captain ANTHONY DESMOND FISK, MB CAMB., RAMC

WOUNDED

Captain J. H. BENNETT, RAMC
Lieutenant R. BRIGGS, RAMC
Captain N. G. D. CAMPBELL, BM OXFD, RAMC
Captain S. M. P. CONWAY, MC, LRCPI, RAMC
Captain J. C. F. CREGAN, MRCS, RAMC
Captain N. C. ROGERS, MB LOND, RAMC
Captain J. SCOTT, RAMC

DIED

Major BARNETT FREEDMAN, MBCS, RAMC

AWARDS

MENTION IN DESPATCHES

The following RAMC officers have been mentioned in recognition of gallant and distinguished services in Italy:

Brigadiers.—J. J. Magner, MC, J. G. Morgan, OBE.

Colonels.—C. B. C. Anderson, OBE, A. Angus, J. T. McOuat, OBE, R. M. Savege, OBE, MC, C. H. K. Smith, OBE, MC, J. R. N. Warburton, MC, G. G. Drummond.

Lieut.-Colonels.—J. H. Ward, DSO, MC, W. A. Ball, W. S. Brindle, H. A. Brittain, J. D. Easton, OBE, W. Graham, L. J. Haydon, L. G. Irvine, D. MacD. Lyon, D. M. Mitchell, W. Patrick, G. W. Molyneux, E. F. S. Morrison, MC, J. J. O'Connell, OBE, J. Pyle, MC, J. H. Sangster, A. Wilcox, P. H. Wood, N. G. G. Talbot.

Majors.—S. S. Chesser, S. Alstead, A. H. Baker, E. L. Carter, F. A. Denz, J. F. Ford, E. M. Griffin, W. F. Hamilton, W. A. Heggie, MC, C. C. Hurst, D. B. Jagger, D. Jefferiss, R. C. Little, J. C. MacKillop, B. J. Malley, D. Matheson, J. M. McKiddie, J. D. N. Nabarro, A. I. Ross, H. M. D. Shepherd, N. J. Y. Simpson, A. Stuart, H. Waters, W. R. West-Watson, MBE, J. H. Whittles, E. G. Wright.

Captains.—H. Auger, E. Batley, O. H. Belam, C. Cameron, J. W. M. Christie, T. B. Davidson, K. B. Dawson, D. C. Devine, G. F. Edwards, MBE, J. T. A. Essex, C. Giles, S. J. G. Gilmour, R. T. Grime, A. Henderson, A. W. F. Heron, E. W. Lindeck, J. G. Macarthur, MC, D. Macdonald, J. McLean, L. F. McWilliams, F. E. Milson, A. E. Rampling, E. M. Sewell, J. M. M. Steven, M. G. Sutton, R. T. B. Watson, C. W. M. Whitty, M. Wirtheim.

Lieutenants.—C. Crefficld, F. B. Lee, R. C. Medland.

MEMOIR

Captain F. MURRAY WAINMAN was killed by enemy air action near Falaise in Normandy during August. Born in 1916, the younger son of Mr. F. J. Wainman of Glasgow, he was educated at Glasgow High School and University, graduating in science in 1936 and in medicine three years later. After six months as house-surgeon at Glasgow Royal Infirmary he joined the RAMC in 1940, and a year later was posted to Egypt. He served with the Eighth Army in North Africa and in Italy until the end of 1943. Tall and well built, Murray Wainman's quiet unassuming manner hid an adventurous spirit. Essentially a man of action, he was posted at his own request to an armoured regiment soon after he joined up, and he earned the admiration of his men and unit by his coolness and daring while attending the wounded under fire. As a boy and as a student he was keen on yachting and rugby football, and after leaving school he played for Glasgow High School FPs.

Yorkshire Post

"... So long as we permit the sale of combinations containing anywhere from 7 to 10 different vitamins and 5 to 8 different minerals in a single pill, with the hope that something in the mixture will hit something that the patient has, we are getting farther and farther away from scientific medicine."—Dr. MORRIS FISHBEIN, *J. Amer. med. Ass.* 1944, **126**, 759.

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Public Health

SOME OBSERVATIONS ON SCABIES AND ITS TREATMENT

HORACE A. NATHAN, MRCS, DPH
MEDICAL OFFICER, EPSOM AND EWELL BOROUGH COUNCIL

SCABIES is often regarded as a war disease. But for some years before this war the annual reports of the Chief Medical Officer of the Board of Education drew attention to a rising incidence among school-children.

AGE-DISTRIBUTION AND SYMPTOMS

Two scabies clinics were set up in Epsom and Ewell in 1942.

At clinic A 516 cases (178 males and 338 females) were treated in the year ending Aug. 7, 1943. At clinic B 294 cases (105 males and 189 females) were treated in the year ending Sept. 22, 1943. The charts classify the cases by age and sex.

The preponderance of females is striking. At the higher ages this might be explained by war conditions, and the closer association of females with young children in the home. At the lower ages, the sex difference is much smaller, but the figures do not justify any general conclusion.

The impression I have formed is that infection takes place among school-children, who carry it home to their families. In the last war men used to contract the condition in the trenches and then take it home; but now the father is infected on leave. Some authorities have shown that the disease is often of venereal origin, but there is no evidence of this in the series of cases described here. Eruptions on the thighs and external genitalia have been unusual.

Having previously spent 16 years in general practice, I would say that scabies seems to have changed its type during this war. I have often seen it without apparent burrows or vesicles, but with only a few sparse reddish spots—which cause great irritation at night—denoting the presence of the sarcoptes. In these cases, the webs of the fingers and toes seem to be free and the eruption has no particular distribution. Moreover, the periods of greatest incidence do not coincide with summer or winter but with attendance at school. During the term the health visitors make their survey and children are regularly sent to the clinics for medical opinion. Many

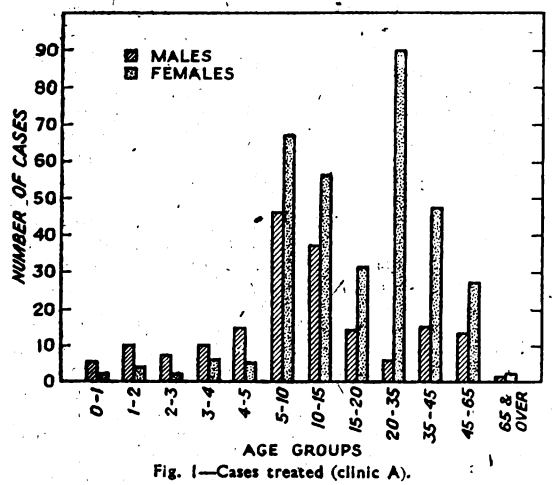

Fig. 1—Cases treated (clinic A).

of these small patients show few signs—perhaps only a grimy burrow—in the web of a finger or at the wrist. Others may have impetiginous areas at the buttocks which do not appear to be scabies; but in the male a few papules or skin lesions on the penis aid diagnosis. The skin of the abdomen is a common site for scratched and unscratched papules. Although the folds of the axilla, especially anteriorly, often show spots, no special part of the body surface can be properly defined as a diagnostic area.

The detection of the disease has become more difficult, and all types of skin lesion, including impetigo, are suspect. All cases must be carefully examined, and one is sometimes fortunate in tracking down an odd burrow, hitherto undiscovered, and later in picking out the acarus. So varied are the skin lesions, scratched and unscratched, that I am coming to believe that every patient complaining of severe skin irritation in bed should be offered treatment.

DIAGNOSIS AND TREATMENT

In doubtful cases itch mites are sought with the point of a needle. The mites are then examined microscopically: the suspected speck is mounted on a slide with a drop of 'Lactophenol' (BDH 20% phenol) and the mites seem to swell up and show clearly.

All patients are bathed with hot water, and carbolic soap is liberally applied. They are thoroughly dried, are painted with a preparation of benzyl benzoate emulsion made up with 'Lanette" wax SX (Mellanby and Johnson 1942), and are given clean underclothing. After 48 hours they are again bathed and repainted; again clean underwear is put

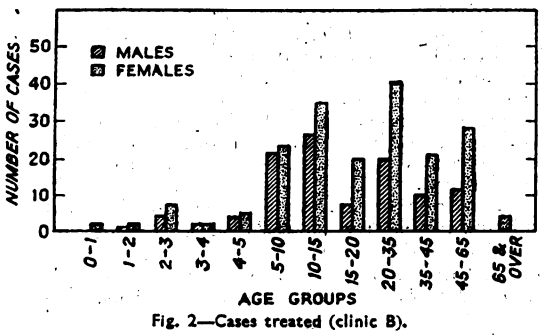

Fig. 2—Cases treated (clinic B).

on, and they are told to apply, night and morning, a powder consisting of equal parts of zinc oxide, starch, and boracic acid. Powdering is continued for a week, after which they are inspected by the medical officer; the lesions are then found to be quite pink, and in another week they become small brown scabs which dry and fall off.

No patient in this series has developed dermatitis while receiving benzyl benzoate treatment only. Two did complain of smarting thigh rashes but they had been treated elsewhere with sulphur. After their second treatment, on the lines set out above, they cleared up without further trouble.

FOMITES AND REINFECTION

The Ministry of Health Memorandum (1940, 1942) did not recommend the disinfection of clothing, although MacCormac (1943) considers that infection may be derived from blankets and bedding. In the routine of our clinics all patients are instructed to wash their underwear and sheets with carbolic soap, which is distributed free by the public health department. The blankets are aired by hanging them up for a whole day in the patient's garden or backyard. In a few cases where reinfection occurred patients arriving for further treatment, some weeks later, were told to have their bedding and blankets ready so that they could be called for and steam-disinfested.

Reinfection was often traced to refusal of treatment by one member of a family because he was not yet suffering from skin irritation; when his itch mites had incubated, he reinfested the rest of his household. It was seldom necessary to treat a person a third time in order to clear up skin eruptions; only half a dozen cases in the whole series required a third treatment. In obstinate cases, where a particular part of the body, such as the hands, did not clear up, one extra painting on that part has been found successful, even without the washing in hot water. Treatment by one application, as recommended by Graham (1943), did not clear cases satisfactorily; indeed, itch mites isolated after treatment were found to be alive and therefore capable of reproduction.

ADMINISTRATION OF CLINICS

Clinics are held daily and all contacts are treated whether showing eruptions or not. Anyone complaining of irritation at night is presumed to need treatment.

A special register is kept of the name, address, age, occupation, and dates of treatments given to patients, inspections being noted in a special column. Reinfections

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are filled in with red ink. The environment of each reinfected patient is carefully investigated. A consent form must be signed by the patient or (if he is under 16) by the parent or guardian. All particulars are copied on a card (following the routine practice used for infectious fevers), and sanitary inspectors are instructed to call at the patient's house to make all necessary inquiries. Should patients not arrive for treatment regularly, or should the contacts fail to appear, the sanitary inspector or health visitor is instructed to follow up by further visits. It has never been found necessary to compel treatment by invoking the Scabies Order, 1941.

Some of the views in this paper may differ from those now current; but they are based on the observations made in this limited survey. On examining further cases and figures for the months following those covered here, I found no reason to vary my conclusions.

SUMMARY

Experience at two scabies clinics suggests that the disease has changed its type in the last few years, making diagnosis more difficult, and that it has become more prevalent among school-children.

Females, especially adults, are possibly more susceptible to infection than males. In this series there were many more females, especially in the age-groups 15–20, 20–25, and 35–45 years. Among school-children in the age-groups 5–10 years and 10–15 years, girls preponderated.

No cases of dermatitis have developed in this series after benzyl benzoate treatment.

I wish to express my thanks to Dr. Cyrus Ive, MOH for Epsom and Ewell, for permission to publish this paper, and to Sir Arthur MacNalty for his helpful suggestions.

REFERENCES

Graham, J. R. (1943) *Brit. med. J.* i, 413.
MacCormac, H. (1943) *Ibid*, ii, 667.
Mellanby, K., Johnson, C. G. (1942) *Ibid*, ii, 1.
Ministry of Health (1940) memo 229, revised 1942.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED JAN. 6

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1462; whooping-cough, 1538; diphtheria, 439; paratyphoid, 1; typhoid, 8; measles (excluding rubella), 11,947; pneumonia (primary or influenzal), 1242; puerperal pyrexia, 124; cerebrospinal fever, 49; poliomyelitis, 3; polio-encephalitis, 2; encephalitis lethargica, 0; dysentery, 204; ophthalmia neonatorum, 63. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Jan. 3 was 961. During the previous week the following cases were admitted: scarlet fever, 53; diphtheria, 17; measles, 71; whooping-cough, 24.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 13 (0) from measles, 15 (0) from whooping-cough, 14 (0) from diphtheria, 41 (6) from diarrhœa and enteritis under two years, and 55 (9) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 4 fatal cases of whooping-cough. Liverpool and Leicester each had 4 deaths from influenza.

The number of stillbirths notified during the week was 224 (corresponding to a rate of 28 per thousand total births), including 20 in London.

ELLA SACHS PLOTZ FOUNDATION.—During the 21st year of this foundation for the advancement of scientific investigation 27 applications for grants were received, of which 19 came from the United States and 8 from five different countries in Europe, Asia, and South America. The total number of grants made during the year was 18. Grants are made to researches in medicine and surgery. They may be used for the purchase of apparatus and supplies needed for special investigations, and for the payment of unusual expenses incident to such investigations, including technical assistance, but not for providing apparatus or materials which are ordinarily a part of laboratory equipment. Stipends for the support of investigators are granted only under exceptional circumstances. The maximum grants will usually be less than $500, and applications for the year 1945–46 should be sent before April, 1945, to Dr. Joseph C. Aub, Massachusetts General Hospital, Fruit Street, Boston, Mass., USA.

Letters to the Editor

WHO SHOULD FEED THE SICK?

SIR,—In your leading article of Jan. 6 you assert that "improper social distinctions have crept into hospital feeding," that "officers may have good food at the expense of other ranks . . . who do not always get enough," and that "'surplus' rations from the public wards may be used to make sweets and puddings for the private patients' supper." As these are grave charges which have already been quoted in the public press, and are seriously calculated to promote social discontent, it would be interesting to know on what evidence they are founded.

Streatley, Berks. ROBERT HUTCHISON.

*** "Full diet" patients in general wards do not always receive their full ration: thus in three hospitals mentioned in the King's Fund report the fat issued daily averaged 45, 35, and 47 g. instead of 77 g. In some hospitals jam, marmalade, butter, and bacon seldom or never appear in the public wards, but are regularly given to private patients and officers. Competent observers have no doubt that abundance in one part of the hospital is sometimes related to scarcity in the other part. Our own purpose will be served if our readers make certain that these "grave charges" cannot be sustained against the hospitals with which they are connected.—ED. L.

TREATMENT OF DIPHTHERIA

SIR,—I desire not to fan but rather to quench the embers of this old controversy about the dosage, and methods of dosage, of diphtheria antitoxin. "Dosage," wrote Claude Ker long ago, "must be decided by observation of results in actual cases, and these results, after all, in spite of statistics, must be a matter of personal opinion." Since it is the basis of the free practice of medicine, this is a view with which no clinician will quarrel. Nevertheless, personal opinions may be modified, as the years pass, as the result, for example, of improvement in the therapeutic weapons provided by laboratory research-workers or the laying by them of old bogies. My personal opinion, already expressed, here and there, in print, is that it is rarely necessary to exceed a single dose of 50,000 units of antitoxin provided part or whole of the dose is injected intravenously. I thus agree substantially with the suggestion in your leading article. I must add that my opinion as to the upward limit of dosage has been influenced by personal clinical observations during the last few years of the progress of patients treated with the current disaggregated (enzyme-digested) sera to which I refer again below. Much of the controversy turns upon the importance to be attached by the clinician to "avidity."

Glenny and Barr[1] point out that "it was suggested as early as 1900 by Roux and in 1904 by Cruveilhier that the curative power of a diphtheria antitoxic serum (DAS) was not solely dependent upon its antitoxic value." There was not only a quantitative but a qualitative value and "the term 'avidity' was introduced by Kraus" to indicate "firmness of combination with toxin." *Individual* samples of DAS vary in avidity. Some combine loosely with toxin "forming complexes which dissociate considerably on dilution" (Glenny, Pope, and Waddington[2]). Methods were devised by Madsen and his co-workers and by Ramon by which the properties of samples of DAS might be compared. Into the details of these methods it is unnecessary to enter; they are outside the province of the clinician, who only needs to know (what, apparently, some do not) that "batches of antitoxin prepared for clinical use are blends obtained from a number of different horses" and "that such blends make it probable that the avidity has little practical importance" and "is of no importance at all if each constituent of the mixture has a correct in-vivo/in-vitro ratio" (Glenny and Llewellyn-Jones[3]). If, for clinical purposes, avidity can be discounted, so also, logically, can "intensive therapy" in the sense of repeated doses. An additional dose, rather than repeated doses on the instalment system, is called for when it has become clinically manifest

1. Glenny, A. T., Barr, M. *J. Path Bact.* 1932, **35**, 91.
2. Glenny, A. T., Pope, C. G., Waddington, M. *Ibid*, 1925, **28**, 279.
3. Glenny, A. T., Llewellyn-Jones, M. *Ibid*, 1931, **34**, 110.

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that the first dose was under-assessed, and—since time is vital in the treatment of diphtheria—it should be given intravenously, especially if the first injection was intramuscular. On the other hand, it is often not realised that choice of the intramuscular route implies recognition of the fact that no *effective* concentration of antitoxin in the blood-stream will occur for many hours. How often has one seen the premature injection of a second dose of antitoxin by the intramuscular route six or eight hours after the first because no obvious clinical improvement was manifest after this short interval! However, as Osler wrote, "the danger is in giving too small and not too large a dose."

So far, your correspondents have not referred to what I consider to be an outstanding achievement in the preparation of DAS which has not only laid the bogy of serum reactions but has also in my opinion justified the employment of smaller doses than were called for in the days of the older salt-precipitated products. The disaggregated sera of Pope [4 5] have been used in my wards since their introduction. I am satisfied that this refined DAS has, apart from its freedom from foreign proteins, all the other advantages in the clinical field that it was shown to possess in laboratory trials by Glenny and Llewellyn-Jones [6]; inter alia, it is "absorbed more rapidly and eliminated more slowly" than salt-precipitated DAS. Hence in large part is due my agreement with the opinion expressed in your leading article.

London, N15. E. H. R. HARRIES.

AMŒBIASIS

SIR,—Dr. J. Graham Willmore is in error in attributing to me the conception or the use of the appellation "Liverpool" treatment for amœbiasis. I myself have never employed this designation, which I heard for the first time at the discussion on amœbiasis at the Royal Society of Tropical Medicine. I there understood it to refer to one course of "combined" treatment employed here for many years, the details of which I supplied, at their request, to the Service authorities who wished to try it out in conjunction with other courses of treatment for chronic amœbiasis. This particular course was elaborated by my late colleague, Prof. Warrington Yorke, and myself between 1926 and 1930, and originally was founded on one described by Willmore and Martindale in 1926. It was subsequently modified and now differs only in minor respects from the course later elaborated by Dr. Willmore, as he rightly points out; it is one of several such "combined" treatments which are at present used in Liverpool in an endeavour to eradicate chronic amœbic infections of the gut. For none of these courses is any claim of fundamental originality made.

Liverpool School of Tropical Medicine. A. R. D. ADAMS.

DEATH AFTER INTRAVENOUS NEPTAL

SIR,—I was interested to read Dr. Rennie's description of another sudden death after intravenous 'Neptal' (Jan. 13, p. 53). Considering the widespread use of the drug, the number of toxic manifestations reported is extremely small, but I wonder whether severe and sometimes fatal reactions are not occurring with greater frequency than is commonly assumed.

During the last three years I have witnessed 4 deaths after the intravenous injection of two c.cm. of neptal and 3 severe general reactions from which the patients recovered. The patients were all suffering from congestive heart-failure with marked œdema and effusions into the serous cavities. The clinical picture resembled that described by Dr. Rennie. One to three minutes after the injection the patients became distressed and dyspnœic. They lost consciousness and looked pale, cyanosed, and shocked. Distension of the cervical veins was noticed. There were a few convulsive movements, the pulse became imperceptible, and the patients died about five minutes after the injections. In the less severe reactions the patients made a complete recovery. An autopsy was done in 3 cases. They all showed well-marked engorgement of the right side of the heart with distension of the big veins, and the lungs were dark and congested. The kidneys in 2 patients were abnormal. In the first they were small and contracted, typical of chronic nephritis. In the second they showed evidence of acute glomerular nephritis—the œdema which had been thought to be due to chronic rheumatic heart disease had been of renal origin. Two of the patients had had no previous injection of neptal, so acquired sensitivity to mercury is unlikely to be the cause of these severe reactions. The clinical picture is very much like that observed in anaphylactic shock. Neptal may further damage abnormal renal tubules and lead to the sudden setting free of a histamine-like H-substance which will cause the unexpected death.

Essex County Hospital, Wanstead. E. FRANKEL.

4. Pope, C. G. *Brit. J. exp. Path.* 1938, **19**, 245.
5. Pope, C. G. *Ibid*, 1939, **20**, 132, 201.
6. Glenny, A. T., Llewellyn-Jones, M. *J. Path Bact.* 1938, **47**, 405.

TRACHOMA AND SULPHONAMIDES

SIR,—In his letter in your issue of Dec. 30, Major MacCallan expressed the view that sulphonamide medication is ineffective against the virus of trachoma. During the past 6 years I have used sulphonamides extensively, both internally and by local application, in the treatment of trachoma. Internally the amount given was ½ grain of sulphanilamide per lb. body-weight during the 24 hours. This dosage was continued for 14 days, and for a further 14 days half the amount was administered daily. I am in complete agreement with Major MacCallan that sulphonamides have no effect on the virus of trachoma. In my opinion it is their beneficial effect on the secondary infections so often associated with trachoma which has led other people to conclude that a curative effect has been obtained upon the trachoma itself. Dramatic alleviation of distressing symptoms due to a secondary infection, such as photophobia, can be produced. It is because of this that I have continued to use sulphonamides, but while doing so I have come to realise that they were having no effect on the trachoma per se. In order to prove that the sulphonamides were effective against the virus of trachoma it would be necessary first to discover the presence of inclusion bodies in particular cases, and then demonstrate their disappearance after a course of sulphonamide therapy.

Dublin. F. S. LAVERY.

IN WHICH WE MIGHT SERVE

SIR,—Dr. Batten's point that the Board of Admiralty has powers far exceeding those of the proposed Central Health Services Council may well be true; but Admiral of the Fleet Lord Chatfield has given his considered opinion that the Board of Admiralty, lacking as it does the right to present its advice direct to Parliament, has been powerless to warn the public of the appalling danger in which it stood from 1932 to 1939. He advocates the setting up of a Defence Committee with direct access to Parliament. If politicians have shown such irresponsibility in the past in the life-or-death matter of national defence, it would hardly seem prudent for the medical profession to submit itself to a politician—that is to the Minister of Health—without the safeguard of an advisory committee having the right of publishing its report to Parliament year by year.

Bridlington. P. D. H. CHAPMAN.

MEDICAL FILMS

SIR,—Your readers interested in rabies may like to be reminded that there is a film containing a case-illustration of a boy affected with this disease. It shows well the apprehensive facies, the clarity of mind, the reluctance to drink, and the spasm of face and neck muscles. The film may be hired from the Kodak Medical Film Library, Kingsway, London (16 mm. silent). We would like to receive information from anyone overseas (or in Britain) who knows of other films of this disease.

In the review of Russian films (Jan. 13, p. 69) you talk of the picture "jigging about the screen all the time." This defect may arise in a variety of ways. If the camera is unsteady while the picture is being taken—for instance, if it is held in the hand or on a loose tripod-head—the movement of the picture on the screen will be a relatively slow one, and up-and-down or rotary; this is known as "weaving." But if the pull-down mechanism in the camera, or more rarely in the printer, is worn, the movement of the picture on the screen will be a quick one,

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and up-and-down only; this is known as "jittering." If these defects are present on the original record nothing can be done to improve them, but if only on the release print a new print can be made which will remain steady on the screen.

S. J. REYNOLDS,
Hon. Sec., Medical Standing Committee,
Scientific Film Association.
London, SW7.

THE TYPHOID-SALMONELLA GROUP

SIR,—In your issue of Dec. 30 Capt. J. F. Goodall reports a case in which a primarily inagglutinable strain of *Bact. typhosum* was obtained by blood-culture from a very ill patient. Such cases are not very rare. The atypical behaviour is not always due to a Vi antigen, but may be attributed to some—so far unidentified—protective covering developed by typhoid bacilli, and perhaps other organisms, in the human blood-stream.

Many years ago I isolated an organism giving cultural reactions of *Bact. typhosum* from the blood of a patient with symptoms resembling enteric fever. This organism agglutinated to titre with BW & Co. antiserum but not with MRC serum from the Oxford laboratory. A sealed agar slope of the organism, with a bottle of the erring serum, was sent to Prof. A. D. Gardner, who reported that by the time they reached him (some six weeks in transit) the organism agglutinated perfectly with the serum. This was before the Vi materials became generally available. Several other strains with aberrant behaviour were isolated—always from blood-cultures—and all "came into the fold" after prolonged subculture. (We used to call these strains *B. assidi* after the laboratory assistant, Ali Hassan Assidi, who made the first isolation.)

Recently *B. assidi* again appeared in a blood-culture from a (clinically) typhoid patient. This strain gave the cultural reactions of *Bact. typhosum* but would not agglutinate with MRC or BW & Co. sera, nor with the serum of the patient. We tried the culture with Felix's antityphoid serum (Lister Institute), which is supposed to contain Vi agglutinin, and the blood of the patient with the Vi suspension supplied by the MRC, all results being negative.

This experience is worth recording since clinicians often try to "hustle" laboratory-workers with the object of provoking premature disclosures. In these atypical instances the laboratory-worker is within his right to refuse a definite opinion until the strain in question comes into line. This attitude often infuriates the clinician, but a suspension of judgment cannot be unknown in normal clinical practice, and "a fellow feeling" (all too rare) should make the impatient clinician "wondrous kind."

FRANK MARSH,
Pathologist, Anglo-Iranian Oil Co., Persia.

Obituary

WALTER ESSEX WYNTER

MD LOND., FRCP, FRCS

Dr. W. Essex Wynter, consulting physician to the Middlesex Hospital, died at Newbury on Jan. 4, in his 85th year. Unusually gifted, but lacking in ambition, he early gave up his practice and hospital appointments in London to spend a happy and active retirement at Bartholomew Manor, his 14th century home, where he grew his own tobacco and brewed his own mead. Here he and his wife spent skill and time on the intelligent repair of the manor and its cottages, some of which soon became the homes of retired Middlesex nurses. And in 1926 with discriminating generosity Dr. Wynter offered the manor itself, with an endowment for its upkeep, on the death of his wife and himself, to the hospital for the same kindly purpose.

The son of Andrew Wynter, MD, who practised in Chiswick, Walter Essex was educated at Epsom College and at the Middlesex and St. Bartholomew's Hospitals. He qualified in 1885, and when he took his MB with honours in 1887 he had already been a fellow of the Royal College of Surgeons for two years. He was elected FRCP in 1897 after he had already been for some years physician to the Middlesex Hospital and lecturer in medicine in the medical school. Though at heart a physician, and a physician with a flair for diagnosis, his interest in surgery continued, fostered by his intimate friendship with Bland-Sutton, and he made a point whenever possible of watching the operations on his own patients. His surgical colleagues too found him ready with apt suggestions, which he himself rarely bothered to follow up. For instance he suggested lumbar puncture, on anatomical and physiological grounds, some time before Quincke's work made this a routine diagnostic and therapeutic measure. At the Royal Society of Medicine in 1914 he described the results of splenectomy in acholuric jaundice, an operation undertaken by Bland-Sutton at his suggestion. He wrote but little, his series on *Minor Medicine* which first appeared in the *Middlesex Hospital Gazette* was published as a book in 1907 and his *Manual of Clinical Pathology* in 1890. His disinclination for private practice was not due to indolence, for he was assiduous (though not always punctual) in his hospital attendance, and he carried his interest in his patients into retirement, where he gave generously of his counsel and time to his colleagues and to the Newbury and District Hospital.

"With Wynter's logical reflective mind," writes R. A. Y., "went a keen almost intuitive aptitude in the diagnosis of difficult medical problems. He had a most attractive gentle personality with a kindly sense of humour—which endeared him to his colleagues and to all the students and residents who worked with him. He ambled through life unhurried, unperturbed, and serenely absorbed in the enjoyment of his interests and his hobbies, among them fly-fishing of which he was an enthusiastic devotee. He certainly adopted Shakespeare's advice to 'fling away ambition'; perhaps that is why he was one of the happiest men I ever knew."

Dr. Wynter married Miss Ada Wills, of Bristol, who died in 1937.

JOSEPH GRIFFITHS

CMG, M D EDIN., M CHIR CAMB., F R C S, D P H

FROM 1887 until his death on Jan. 4 Dr. Griffiths spent his life in Cambridge. The son of a farmer at Pontheny, Carmarthenshire, he was born in 1863. At Edinburgh, where he received his medical education, he was Murchison scholar and graduated with honours in 1885, taking his MD with gold medal five years later. He became assistant to the professor of pathology at Edinburgh, and his first post at Cambridge was likewise in the pathology department. Soon however he was combining the appointment of pathologist to Addenbrooke's Hospital with that of assistant to the professor of surgery, Sir George Humphry, and in 1892 he joined the surgical staff of the hospital. When Humphry died Griffiths became university reader in surgery and examiner in surgery; but after seven years he resigned his readership because he thought the school should again have a surgical chair. "During this period," writes H. B. R., "he added a large number of pathological specimens to the museum, especially bone preparations, having evolved, with the assistance of his laboratory assistant, Frederick Izzard, a method of maceration which produced beautifully white specimens of bone diseases which were the constant admiration of generations of surgical examiners. He also had a large private collection which he presented to the Royal College of Surgeons." He wrote chiefly on bone and joint injuries and on urogenital disorders, especially prostatic enlargement, and in 1895 he delivered three Hunterian lectures on the testis.

During the war of 1914–18 Griffiths commanded the 1st Eastern General Hospital, with the rank of colonel. This unit was mobilised at Cambridge the day after war was declared; and finally occupied open-air huts on the King's and Clare cricket-ground. "The open-air ward was Colonel Griffiths's own idea, and was thought by many to be too spartan; but it proved of undoubted benefit to the patients." For his war services he was appointed CMG in 1918.

As a young man Griffiths was a keen follower of hounds, and in later life his hobby was farming; he also took a keen interest in animal pathology. Besides his Addenbrooke's appointment, he was consulting surgeon to the Huntingdon County Hospital and the St. Leonard's Hospital, Sudbury.

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THE LATE MR. WALTERS

Professor Rendle Short writes: The Bristol Royal Infirmary has for many years been one of those happy hospitals where the surgeons have been able to maintain constant friendly relations with one another, and this comfortable atmosphere has been largely due to the character and influence of C. F. Walters. Until the war came to upset the routine, it was the custom for all the surgeons to meet every Friday, with the residents and students, to give an opinion on four or five cases, shown either because they were of special interest, or because the diagnosis or treatment presented some problem. The junior surgeon gave his opinion first and the senior last. Walters was in his element on these occasions; always sound and sensible; never trying to score off his colleagues; always friendly and helpful.

The son of a chartered accountant, he came to the Bristol Medical School in 1895, qualified in 1900, and was appointed assistant surgeon to the Royal Infirmary in 1909. He took a special interest in bladder and prostate cases, and as the assistant surgeon had very few beds and opportunities of clinical experience were limited, he made ingenious model bladders on which to practise cystoscopy. Always obliging, hard-working, and good-tempered, he was a most congenial colleague, and well liked by his patients. In 1916 he was sent to France, and became surgeon to a specially advanced casualty-clearing station for abdominal injuries on the Somme front, as near the firing line as possible, so that cases might be operated on without delay. The series of 500 emergency operations for abdominal wounds, described by Walters and his associates in 1917, was one of the largest and most successful treated during the war.

He married Gertrude Popham in 1905 and leaves a son and three daughters.

Births, Marriages, and Deaths

BIRTHS

ASHBY.—On Jan. 9, at Bolney, near Haywards Heath, the wife of Captain Michael G. Ashby, RAMC—a daughter.

BALL.—On Jan. 8, at Hunstanton, the wife of Major P. H. Ball, RAMC—a daughter.

FISK.—On Jan. 6, at Birkenhead, the wife of the late Captain A. D. Fisk, RAMC—a daughter.

GOFFE.—On Jan. 10, the wife of Dr. A. P. Goffe, of Deodar Road, Putney—a son.

GORDON.—On Jan. 10, at Walton-on-Thames, the wife of Surgeon Lieutenant K. G. O. Gordon, RN—a daughter.

HOWAT.—On Dec. 29, in London, the wife of Dr. Douglas D. C. Howat—a daughter.

KEATINGE.—On Jan. 11, at Winchester, the wife of Colonel L. R. H. Keatinge, RAMC—a daughter.

LEVACK.—On Jan. 4, at Camborne, Cornwall, the wife of Captain J. H. Levack, RAMC—a daughter.

MACDONALD.—On Jan. 7, at Putney, the wife of Captain I. D. MacDonald, RAMC—a daughter.

MINETT.—On Jan. 11, in London, the wife of Dr. Jack Minett, Colonial Medical Service—a daughter.

WOOD.—On Jan. 7, at Oxford, the wife of Dr. Michael Wood—a son.

MARRIAGES

BORTHWICK—BERRY.—On Dec. 20, at Poona, India, Robert Donnan Borthwick, captain RAMC, to Margaret Eleanor Berry, QAIMNSR.

GASS—CHAPMAN.—On Jan. 6, at Pembury, Thomas Gass, captain RAMC, to Rosemary Chapman, section officer WAAF.

MACKINTOSH—ORMSBY-JOHNSON.—On Jan. 10, at Cairo, Finlay George Mackintosh, major RAMC, to Eileen Ormsby-Johnson.

WILLIAMS—LUMSDEN.—On Dec. 30, in Birmingham, Robert Evan Owen Williams, MB, B SC, to Margaret Lumsden, CSP, MAOT.

DEATHS

BARLOW.—On Jan. 12, in London, Sir Thomas Barlow, Bt., KCVO, MD LOND., D SC, FRCP, FRS, aged 99.

BLATHWAYT.—On Jan. 10, at Bath, Arthur de Visme Blathwayt, MRCS.

BROATCH.—On Jan. 11, at Glasgow, George Thomas Broatch, CBE, MB EDIN., surgeon rear-admiral, of Eastbourne, aged 82.

CAMERON.—On Jan. 10, in Edinburgh, Isabella Douglas Cameron, MD EDIN., DPH, late senior medical officer in the Ministry of Health.

CROMIE.—On Jan. 7 at Nailsea, Somerset, George Cromie, BA NZ, MB EDIN., aged 73.

HAWTHORNE.—On Jan. 10, in London, Janie Lorimer Hawthorne, MB GLASG., wife of Dr. C. O. Hawthorne.

MATSON.—On Jan. 12, in Dublin, John Agar Matson, MD DUBL., FRCPI.

MENZIES.—On Jan. 12, at Radlett, William Francis Menzies, MD, B SC EDIN., FRCP, first medical superintendent of Cheddleton Hospital, Staffs, aged 81.

NICHOLSON.—On Jan. 7, at Northampton, Edgar Nicholson, MRCS.

PEDLEY.—On Jan. 9, at Bournemouth, Charles Franklin Pedley, MRCS, DPH, deputy medical officer of health for Bournemouth.

WHITWELL.—On Jan. 9, in London, James Richard Whitwell, MB EDIN., formerly medical superintendent of St. Audry's Hospital, Melton, Suffolk, aged 81.

Notes and News

BRITISH ASSOCIATION

ON Jan. 12 and 14 the British Association held a conference on the place of science in industry. The conference was opened by Sir Richard Gregory, and at its four sessions the chair was taken by Mr. Ernest Bevin, Lord McGowan, Sir John Greenly, and Lord Woolton. The first three sessions were mainly concerned with industrial research and development, but the fourth, looking to the future, gave all its attention to what science might accomplish in the broad field of health. Lord Woolton, who opened this last discussion, spoke of the debt of gratitude which the Government owed to science for educating the public in the principles of nutrition during the pre-war years. This eased the stern task of the Ministry of Food, and it was through scientific guidance that the nutrition of the people had actually improved during war-time. In the future, Lord Woolton said, the scientist must be given his chance, because the nation would be too poor to afford the extravagance of preventable ill health. He emphasised the need for spending a greater part of the national income on research than the present meagre 0·1 per cent., and urged that the State should take a full share in promoting fundamental research as well as applied science.

Mr. E. Carter dealt with the housing problem of the future, laying stress on the need for closer coöperation between the technical experts and those concerned with design and beauty. The food policy of the future was seen by Sir Joseph Barcroft as a unique opportunity for collaboration between agriculture, veterinary science, and the health organisation, but little real advance could be made until Britain's future policy in food production was known.

Dealing with the contribution of science to health, Prof. J. M. Mackintosh, FRCP, referred to the need for a wider distribution of public-utility services such as water and electricity. In all branches of preventive medicine there should be closer coöperation between medical and technical officers to serve the common purpose of human welfare.

Sir Lawrence Bragg, in summing up, suggested that the real question was what we as a nation wished science to accomplish. In the past a great deal of scientific effort had been misdirected or wasted because public authorities, industrialists, and other bodies responsible for the public welfare had failed to apply the findings of science to everyday problems of life and work.

NEEDS AND BENEFITS

COMMENTING on the Government's white-paper on National Insurance, the Charity Organisation Society expresses satisfaction that the plan follows in its general structure the proposals of the Beveridge report. It notes, however, that the Government have rejected the subsistence principle: benefits will not be related to scientific estimates of nutritional and welfare requirements, or to the general cost of living. While appreciating the reasons for these decisions, the society suggests that rates of benefit should be periodically reviewed by an independent board.

On children's allowances the society points out that payment in kind to children attending school would penalise those children who are unable to attend school, either because they are too young or because of sickness or any other cause, and the deprivation would fall on them at a time when presumably their needs would be greatest. The society therefore urges that children's allowances should be paid out of taxation at the rate of 8*s*. per week for each child after the first. The allowance should be paid in the middle of the week, and free milk should be available to all children below the school-leaving age, in addition to the children's allowance. A school meals service should be established for all children, but the meals should be paid for by the parent out of the children's allowance, in order that those children whose parents prefer them to return home for their dinners may not be penalised.

NATIONAL WAR FORMULARY

SOME alterations and additions to the second edition of the National War Formulary, to conform with the Seventh Addendum to the British Pharmacopœia and with the present supply position, will come into force on Feb. 1. Of the additions the most important is "Cream of sulphanilamide and sulphathiazole" for burns. This cream takes some three hours to dispense, so it will be kept ready for use in 1 oz. tubes only. Since it falls in Schedule IV of the Poisons Regulations prescribers must state the amount to be supplied.

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Hæmothorax may, however, be indistinguishable clinically from atelectasis, and this is particularly the case if clot has been deposited at the bottom of the pleural cavity. Again, in a large proportion of penetrating wounds some air gains access to the pleural cavity at the time of the injury. In many the wound in the chest wall seals off spontaneously and the air is quickly absorbed, but in some the air is retained and mixes with the blood, producing bubbles and froth. If this state of affairs obtains the patient does not present "the well-recognised signs of a pleural effusion." Moreover, surgical emphysema is common in the first 48 hours after any penetrating wound of the chest; it may mask the signs of a pleural effusion.

The abnormal position of the apex-beat, and of the trachea in the suprasternal notch, are generally quoted as cardinal points in the diagnosis of hæmothorax. I doubt the importance of both these signs, and regard *displacement of the mediastinum, away from the side of the hæmothorax, as a late and indefinite sign.* A *massive* hæmothorax can produce displacement particularly if the patient be examined in the sitting position. The conditions which obtain in a recent hæmothorax are importantly different from those in an inflammatory pleural effusion which has resulted from a pathological process in the lung. When blood is suddenly poured out into a normal pleural cavity it is easily accommodated by a diminution in the size of the lung upon the affected side; the lung, being normal, simply retracts towards the hilum. This process goes on until several pints of blood have accumulated before the mediastinum is displaced, and the only circumstance in which an early shift is likely is when pre-existing pleural adhesions so limit the spread of the fluid in any direction that the intrapleural pressure is increased. Another point is that the hemithorax of an adult can contain at least 7–8 pints of blood. In the case of an effusion, developing as a complication of such a process as pneumonia, the ability of the fluid to spread in any direction is soon limited by protective adhesions and the natural elasticity of the lung is diminished by consolidation, œdema or congestion. With these points in mind I would postulate that if a *moderate* hæmothorax produces *early* displacement of the mediastinum the pleural cavity has probably been partially obliterated by previous adhesions. In one case, which came under my care, radiography during convalescence showed that the whole of the apical pleura had been obliterated over an old healed tuberculous lesion, and in this man early displacement of the apex-beat had been recorded on the field card.

The blood in an early hæmothorax is free to move about the pleural cavity (whether air be present as well or not) and the position it occupies is dictated simply by the position of the patient. The result is that *the early signs are those of shifting dullness*, and for this reason there is a tendency to underestimate the amount of bleeding which has taken place. If the front of the chest be examined, as the patient lies on his back, a resonant note and good breath-sounds can be heard, because the aerated lung is floated forwards upon the fluid in the paravertebral gutter. When the same man is examined in the sitting position the blood will have gravitated into the costophrenic sulcus, but much of it will be disposed right across the base of the chest, and in the interlobar fissures, and the more the patient leans forward the less dullness will be detected at the base. There is in fact no way of assessing how much blood is present in the pleural cavity in any given case. A hæmothorax which extends as high as the 6th rib posteriorly is often described as being "of moderate extent," but if the chest of such a patient be opened it is not unusual to find that it contains 2–3 pints of blood, and it is generally true to say that a great deal more fluid is present than one expects.

A pleuropericardial rub, which is difficult to distinguish clinically from a pericardial rub, is not uncommon. This finding is not of much clinical significance, and the fact that the condition clears up quickly with treatment is the best argument against its cause being pericardial inflammation. I have recently operated upon a patient with a definite rub of this type, and after the clot had been turned out of the pleural cavity was able to convince myself that there was no pericarditis.

The only X-ray examinations of any diagnostic value are those made with the patient in the sitting position. If he is lying flat, as is often the case, the films show the "typical ground glass appearance." Antero-posterior and lateral films taken with the arms elevated are necessary. The X-ray picture of a hæmothorax is not the same as the textbook picture of an empyema; that is, it does not cast a shadow which rises from a broad base upon the diaphragm and arches upwards in a curved line towards a point in the axilla. The opacity is dense and homogeneous; it fades out into the normal lung markings above, and except when a fluid level is present (due to the presence of air as well as of blood) it has no definite edge. This opacity is often diagnosed as being due to a pulmonary hæmatoma rather than a hæmothorax.

With the passage of time some measure of clotting develops in every hæmothorax and this favours loculation of the fluid into pockets. These pockets are well seen in lateral films and are particularly outlined in cases where infection with gas-forming organisms has occurred. Pockets of air or gas, together with strands of fibrin, can easily combine to produce an appearance which is almost identical with coils of intestine, and a diaphragmatic hernia may be suggested.

The earliest symptoms of a large hæmothorax are shock, pain and dyspnœa; *the condition may, however, exist without any of these.* The shock and the pain are exactly comparable to similar manifestations in the case of abdominal wounds. The former is often a sign of primary internal hæmorrhage, and a man can easily bleed to death into the pleural cavity without losing any blood upon the surface of the body. The pain, which can be very severe, is the same as that caused by the presence of fresh blood in the peritoneum. It is the pain of acute pleural irritation, and is distinct from that caused by the actual wound; it resembles the pain which follows the introduction of substances such as silver nitrate into the pleural cavity. The severity of the dyspnœa depends not only upon the actual reduction in available breathing alveoli, but also upon such things as pre-existing adhesions in the pleura, and fear. Most patients with chest wounds are frightened at first, and often they either "struggle for breath" or indulge in rapid shallow respirations, both of which militate against efficient breathing.

Although the temperature of a patient suffering from hæmothorax is generally below 101° F, it can rise to 103° F or more, in the early stages, without any infection being present. Pyrexia in patients suffering from hæmothorax does not always signify infection. But infection should be suspected whenever the temperature persists or fails to show a steady progressive decline towards resolution.

TREATMENT

"The mere presence of a hæmothorax warrants neither operation nor aspiration."

Statements of this type have had the effect of convincing many people that active treatment is only necessary in extreme cases. This matter needs examination, for to neglect a hæmothorax is to court trouble.

It is probably true that in all penetrating wounds some blood is present in the pleural cavity, and that in many cases this is rapidly organised and removed without leaving any detectable abnormality of respiratory function. When this is taken in conjunction with the facts that, except in the case of rapid bleeding, hæmothorax does not constitute an obvious surgical emergency and that the patient appears to be in good condition, it is not surprising that general surgeons—who never seem to be quite happy when dealing with the thorax—are prone to adopt conservative treatment.

Now "conservative treatment" is a vague term. To some it implies that nothing, apart from the exhibition of sulphonamides and penicillin, should be done to a hæmothorax; to others it connotes a few spasmodic aspirations at convenient intervals; and to a few it means that frequent and regular aspirations should be carried out until the lung has fully expanded and the pleural cavity has become dry. Most thoracic surgeons favour the last of these interpretations, for they believe that *the basis of the treatment of all intrathoracic wounds is to secure total expansion of the lung at the earliest possible moment.* Whichever view may be taken, I

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submit, that the following points should have been weighed in the balance:

1. A hæmothorax is not an ordinary hæmatoma. It is a foreign body situated in a most vital serous cavity.

2. There is no means of predicting in which cases the blood will ultimately be absorbed by natural processes, as opposed to those in which healing will be followed by scarring and deformities of the chest wall, the pleural cavity and the lung. The harmful effects of a hæmothorax, in those who survive the initial hæmorrhage, may not be manifest until the blood has clotted, until it has become organised or infected, or until the adhesions and fibrosis, which are its legacies, have so deformed the chest wall that normal function of the heart and lungs is impossible. As a young man a patient may suffer but little limitation of his ordinary activities on account of a rigid hemithorax, but the damage becomes progressively obvious as age advances.

3. A hæmothorax may become infected at any time between the moment it is produced and the time it is removed.

4. The blood is purposely left in the pleural cavity by some surgeons because it is argued that its presence produces hæmostasis by reason of the pressure the mass of fluid exerts upon the damaged lung. This conception is based upon several false assumptions. First, it is only likely to have any effect if the bleeding happened to come from the lung, and continued bleeding is almost certainly not of pulmonary origin. Secondly, unless the wound happened to be at the bottom of the lung, the level of the compressing blood might have to rise to the top of the chest before it staunched the flow. Thirdly, bleeding, either into a serous cavity or into the intermuscular planes, is more likely to continue into a hæmatoma, than it is if that hæmatoma be cleared out. Finally, the only circumstance in which aspiration is likely to start a fresh hæmorrhage is when it has been carried to such a point that a high negative pressure exists in the pleural cavity.

TREATMENT BY REPEATED ASPIRATIONS

To be really effective aspirations should be started within 24 hours of the time the patient has been wounded. If conditions in the forward area are such that this is impracticable, treatment should be started as soon as possible afterwards. A delay of 5–6 days means that the difficulties of getting the pleural cavity dry are greatly increased. Air replacement should not be done unless the underlying lung is atelectatic.

Efficient management of a hæmothorax demands frequent aspirations, and these may be difficult to do. The tumult and concussion of a modern battle so disturbs the nervous system of many wounded men that they strongly resent repeated aspirations of the chest, and the mere contemplation of further needling causes much anxiety. Such men will readily consent to any major operation which may be necessary, provided it be done under general anæsthesia, because they can "go to sleep." The remedy lies in the liberal use of phenobarbitone or other sedatives, anæsthetisation of the proposed aspiration site with a *fine* and *sharp* hypodermic needle, and the use of plenty of local anæsthetic. It is imperative not to hurt such a patient if aspirations are to be carried out daily.

In most chest injuries the diaphragm upon the affected side is raised considerably. Puncture of the abdomen is likely to result from any aspiration made too low. As a general observation I would say that aspirations of the pleural cavity are often done too low, just as pleural drainage is apt to be too high. There is a reason, apart altogether from the position of the diaphragm, why aspirations should be done fairly high in the chest: the fluid at the top of a hæmothorax is liquid and easy to draw off, while the fluid at the base contains clots and fibrin which are apt to obstruct the needle.

When aspirations cease to yield a ready flow of fluid blood it is generally said that clotting has occurred. This may be a convenient explanation, but it often bears but little connexion with the actual state of affairs inside the pleural cavity. It has already been mentioned that in every hæmothorax after a few days some clots will be found at the bottom of the space; but to many clotting suggests that the whole mass of material has been converted into a solid from a liquid state. Massive clot is a definite entity but is comparatively rare, whereas difficulty in aspirating the blood is common. It is generally due to faulty selection of the correct site, or to the presence of isolated clots, fibrin and loculation. It is quite usual to find several pints of fluid blood in the chest of a patient who is said to have a clotted hæmothorax.

A hæmothorax may be difficult to aspirate not only on account of clots and loculation but because of fine threads of fibrin which float in the blood: these become engaged in the lumen of the needle as soon as suction is applied. In one such case in which the pleural cavity was ultimately found to contain 5 pints of fluid blood, it was only possible to get out a few cubic centimetres at a time, and the erroneous diagnosis of massive clot was made.

PRACTICAL PROBLEMS

The question of how best to manage a case of hæmothorax is not always easy to answer, and circumstances modify the treatment. To illustrate this point several different types of case will be mentioned.

Hæmothorax which responds rapidly to a few simple aspirations.—In most of these cases the bleeding has stopped soon after the injury had been sustained, and serial X-ray examinations demonstrate that the fluid in the chest shows no tendency to accumulate afresh, but decreases with each successive treatment. In some a relatively large collection of blood can be completely eliminated by one or two aspirations, and the results are excellent in every way. In 2 of my cases a massive serous effusion appeared after the blood had been almost completely evacuated; both of these men did well as soon as the effusions had been taken off.

Massive hæmothorax.—If hæmorrhage is still going on the patient should be given an adequate transfusion and the bleeding-point secured by operation. If the bleeding appears clinically to have stopped, aspirations should be started immediately.

When a great deal of blood is present the difficulty is that it cannot all be taken out of the pleural cavity at one sitting, and that which remains is augmented by the effusion which forms, so that the volume of the fluid can only be reduced in a step-ladder fashion. Under fortunate conditions repeated aspirations at regular intervals will produce a good result in the end, but only too often the exudate, which continues to collect between aspirations, makes the treatment difficult, protracted, and wearisome to the patient. If aspirations are not producing a rapid improvement a thoracoscope should be introduced into the pleural cavity, and all the blood, clots and fibrin sucked out. To be successful this operation should be performed early in the treatment before the lung has been bound down, and before the contents are too solid to suck out easily. Thoracoscopic aspiration is a minor procedure if done under local anæsthesia, and it converts a difficult case into one which is easy to manage. Air is bound to gain access to the pleura during the operation, and this should be taken off after the cannula has been removed. Serous fluid will accumulate in the pleura after operation but this generally responds quickly to a few additional aspirations with a needle.

Hæmothorax into which bleeding continues slowly but persistently for many days or even weeks.—These are generally cases with injuries to the ribs and the chest wall; the bleeding probably comes from parietal vessels or from the liver. Repeated aspirations may succeed in holding the actual volume of the fluid in check, but as time passes fibrin and clots are liberally formed, and a point is reached at which organisation has begun and it is impossible then to empty the pleural cavity. Such a patient is most likely to progress to the state of deformity and disability which has already been described. I have operated upon 3 such patients at periods 3–6 months after the injury, at a time when the deformities were already apparent, and have tried by decortication operations to secure re-expansion of the lung. In this small series the results were disappointing. The results of vigorous courses of breathing and physical exercises are equally disappointing in this group, but some benefit accrues, and treatment on these lines should be prescribed.

What then should be done to avert such catastrophes? In my view the results of aspirations are so poor that an

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intercostal thoracotomy should be performed and the blood, serum, clots and fibrin evacuated as soon as the condition be diagnosed. There are two other reasons for advocating this step. First, it is general surgical experience that in cases of ingravescent hæmatoma the bleeding is often promptly controlled by turning out the accumulated blood even though the bleeding-point is neither found nor secured, and in practice this has been my experience in cases of hæmothorax. Secondly, though the risk of infecting a hæmothorax during the process of a few aspirations is small, that risk increases as more and more aspirations are done. A review of cases with this point in mind has provided conclusive evidence of the truth of this.

Hæmothorax which has clotted.—There are two statements, relevant to this group, which I believe to be wrong:

1. *That clotting in a hæmothorax is rare.*—If the patients are treated efficiently from the start the statement is true; but in modern warfare it is not always possible to do this, and from the cases reaching a coastal hospital it is evident that during periods of rush, at the front, aspirations were often not done for a number of days. It is in this group that clotting, of sufficient degree to make aspiration difficult or impossible, occurs quite commonly, but these are not cases of massive clotting.

2. *That clot is generally a signal that infection is about to occur.*—Here the cart has been placed before the horse, for I doubt if incipient infection causes blood to clot; the tendency is for infection to liquefy clot. A more probable explanation is that as aspirations become progressively more difficult, and the patient's back takes on the appearances of a pincushion, the risk of introducing infection increases; and one day the organisms are put in and the condition goes on to an empyema.

The treatment of a clotted hæmothorax is to open the chest as soon as the diagnosis has been made, to remove the contents of the pleural cavity, and to decorticate the lung, the parietal pleura, and the diaphragm. The results of this practice are good, provided the steps, recommended by Price Thomas and Cleland,[1] and designed to achieve early expansion of the upper parts of the lung as well as of the base, are carried out.

Hæmothorax, complicated by a foreign body retained in the lung.—The size and the actual position of the foreign body have an important bearing on treatment. The remarks which follow do not apply to foreign bodies which are very small, multiple, or situated in the hilum. In all other cases the ideal early treatment (and in the absence of a septic wound of the chest wall *early* signifies any time within the first 3–4 days) is thoracotomy.

At this operation the pleural cavity should be opened sufficiently widely to permit exploration; the blood should be sucked out; the foreign body should be located in the lung and removed along its track of entry (in really early cases) or by wedge resection of the piece of lung including the foreign body (in cases where the track has sealed over); the thoracotomy incision should be closed in layers, including the skin; the air should be taken out of the pleura with a pneumothorax apparatus, and penicillin left in; and finally the pleural cavity should be drained for 48 hours by a water-seal intercostal-tube placed at the site of election or by continuous suction drainage. This operation should be followed by aspirations of any blood or serum which may subsequently accumulate.

There are several reasons for recommending such an operation. First, the patient will almost certainly be convalescent within 10 days and cured within 2 months. Conservative measures at their very best give a second-rate result in a high proportion of cases. Secondly, the track which the foreign body makes, in its course through the lung, is exposed to contamination by organisms which reach the traumatised tissues from the air-passages (even assuming that no organisms have been carried in at the time of infection). There is thus considerable risk of infection arising not only in the lung but eventually in the hæmothorax as well. This is borne out by the relative incidence of infection, reported by many authorities since the beginning of the war, in cases of hæmothorax with and without a retained foreign body. Finally, in several of my cases, treated conservatively at first, a foreign body lodged in the edge of the lung has ulcerated out from its bed and fallen to the costophrenic angle. This was followed by one of two complications; either the patient became suddenly ill with the signs and symptoms of a tension pneumothorax superimposed upon the hæmothorax, or a virulent infection developed in the hæmothorax.

I do not suggest that all patients with the combination of a hæmothorax and a retained foreign body will certainly do badly if treated conservatively: but an important proportion of them will, and the good risks cannot be separated from the bad either by clinical acumen or by any other means.

Hæmothorax as a complication of abdominal wounds.—Any missile which enters the abdomen through the lower chest is apt to cause a hæmothorax. This statement is so obviously true that one may ask why the matter should be mentioned. The reason is that in a number of cases the attention of the surgeon is so focused upon the grave abdominal emergencies with which he is confronted that when he has operated successfully upon these conditions he tends, during the complicated period of postoperative management, to overlook the fact that a hæmothorax has slowly accumulated. This is particularly the case if shock and abdominal hæmorrhage have been so severe that the bleeding into the pleural cavity has not really started until some time after the abdominal operation has been performed; the physical signs which then occur at the base of the chest are only too apt to be regarded as evidence of "postoperative atelectasis" or "pneumonia."

CONCLUSION

"After all, what we call truth is only the hypothesis which is found to work best." (The Golden Bough.)

In presenting these notes I have assumed that the reader is familiar with current literature on the subject of hæmothorax, and so have ventured to discuss points which are controversial, as well as contingencies which are not quite on the beaten track.

1. *Lancet.* In the press.

LOUSE-BORNE TYPHUS FEVER

TRIAL OF SERUM TREATMENT

R. S. STEVENS, MB CAMB.
CAPTAIN RAMC; GRADED PHYSICIAN

DURING the first six months of 1943, twenty-one cases of louse-borne typhus fever were admitted to a military hospital in the Middle East. Seven of these cases were treated with hyperimmune rabbit serum prepared by the Lederle Laboratories of New York.

EPIDEMIC FEATURES

The majority (15) were admitted between March and May at the height of an epidemic affecting the native population, in which 705 cases were treated in hospital. The total civil population of the district was about 120,000 (Dickie 1943); Services personnel ran to several thousands.

Of the cases to be described, a third came from docks operating companies and most of the remainder from Army or RAF workshops. Most of them had been directly supervising natives employed in large numbers in such establishments, and in only one was a history of close contact not established. Troops had been instructed in the dangers of harbouring lice; some patients said they occasionally found one on their clothing, but only two men had seen them on clothing or body at a time consistent with the beginning of the incubation period. No lice were found on any of them on admission to hospital. Several men had abrasions on their hands or forearms, a fact which when taken with the low rate of louse infestation raised the question of direct infection by dried louse fæces shed from native garments on damaged skin; infection through conjunctivæ or nasal mucosa was also possible.

The 21 cases were all unimmunised, and represented sporadic infections from 19 different units; this reflects credit on the louse-control of the units concerned. The hospital personnel receiving and treating typhus were inoculated and none developed typhus.

CLINICAL FEATURES

The clinical picture of severe epidemic louse-borne typhus is so widely recognised that it is sufficient to

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refer only to recent authorities (Mackenzie 1941, Megaw 1942). After the first 14 cases of the 21 in this epidemic a supply of hyperimmune antityphus (European strain) rabbit serum, prepared by the Lederle Laboratories, New York, was made available by the kindness of Brigadier-General L. A. Fox, field director of the USA Typhus Commission. The first case treated received the serum late and probably in insufficient quantity; the remaining 6 were treated earlier and with larger doses which were given in quantity and manner advised by General Fox on his first visit to the hospital. Of the 14 men who did not receive serum 5 died, and the inadequately treated patient died; of the 6 fully treated patients none died.

Initial symptoms of all cases.—Headache was always the first symptom, accompanied by malaise. Five of the 21 cases complained of early sore throat, 5 of vomiting, and 6 of shivering; backache and limb pains were common. Before the rash appeared, a temperature of 103°–104° F, a pulse-rate of 90–100 per minute, considerable prostration, a bloated and intoxicated appearance, very suffused conjunctivæ, and a horizontal leash of vessels from canthus to cornea were almost invariable features. The slight contraction of pupils "stressed by the old physicians, at any rate in Ireland" (Memoranda 1941) was often seen; the smell of a "cupboard containing well-blacked boots" or of "gun-washings," or the "peculiar mousy odour," was only noted twice. Exotic smells are too ingrained in the Middle East to make this sign much more than a metaphysical exercise. The spleen was palpable by the fifth day in all cases but one, firm but not tender. Meningismus was seen five times, herpes labialis thrice. In the use of serum it is important to be prepared to make a presumptive diagnosis if possible before the rash has appeared, or at any rate become typical, for there is reason to associate its efficiency with the earliness of its administration. The average time of appearance of the rash was 4·4 days after onset. At first difficult to see, it became typical in a few hours.

Course of cases not receiving serum.—As the macular or maculopapular stage approached its zenith, and when mottling was most pronounced, the colour of the rash deepened to a dull claret and petechiæ began to appear; this was usually on the seventh day, and they appeared either as central dots in the macules or independently. From this time the rash faded gradually, a blotchy staining often persisting for up to a month. One profuse erythema of thighs seen on the fifth day and one general urticaria seen on the eighth were the only variants of the typhus rash. Fever averaged 14 days in recovering cases, was continuous as a rule but showed a pseudo-crisis on about the seventh day in 7 cases (Megaw 1942). Final termination was by lysis or crisis in about equal proportions. Severe headache persisted throughout the fever, prostration increased, with drowsiness passing into coma, tremors occurred and the tongue became dry and shrivelled. Blood-pressure fell and the pulse became dicrotic. Mental confusion preceded coma; terror, nightmare, and fear of being alone were common. Of the patients who died, 5 had intractable terminal hiccup. Recovery was by a protracted though usually uneventful convalescence.

EFFECTS OF SERUM THERAPY

The first batch of serum, only 80 c.cm., was given in two doses of 40 c.cm. each, intravenously, to a patient (case 7) on the sixth and seventh days; the course of the disease was not modified and he died on the ninth day of the disease. In the next 6 cases, 80 c.cm. was given as soon as the diagnosis was established clinically, 40 c.cm. going into a vein and 40 c.cm. into the muscles of the buttock; on the next day 40 c.cm. was given intramuscularly and on subsequent days 20 c.cm. intramuscularly, if and for as long as the patient appeared to require it; this was difficult to judge, there being no previous series of observations to refer to, but in view of the recovery of all treated cases it can be assumed that any error was not on the side of underdosage. In view of the likelihood of undesirable reactions during the intravenous administration of the serum, it was given slowly—1–3 c.cm. per minute. Two physicians were present and the one not giving serum kept check on pulse, respiration-rate, and blood-pressure. No serious reactions occurred, but 3 patients complained of buzzing in the head, dizziness, "constriction of the Adam's apple," trembling, vomiting or the like; these sensations may have been emotional in part. Intradermal sensitivity tests done before the intravenous injections were negative in all cases.

Course.—The average duration of the fever was the same as in untreated cases, 14 days. The level of fever, however, was in general lower in treated cases. Table I shows the number of readings above certain temperature levels and pulse- and respiration-rates in recovered cases after the sixth day, by which time the cases had received the greater part of their serum. Termination of fever was by lysis in all cases. Two patients ran slight secondary fever (not higher than 101° F) of intermittent type for 14 and 12 days. (Three cases in the untreated group had similar fever for 6, 12, and 3 days.)

TABLE I—TEMPERATURE, PULSE, AND RESPIRATION READINGS AFTER THE 6TH DAY IN RECOVERED CASES

Readings were taken four-hourly in all cases

—	NON-TREATED (8 cases)		TREATED WITH SERUM (6 cases)	
Observations	No. of times	Av. per case	No. of times	Av. per case
Temperature				
Above 104° F	6	0·75	4	0·66
,, 103° F	95	12	30	5·0
,, 102° F	88	11	65	11
Total	189	24	99	16
Pulse-rate				
Above 140 per min.	12	1·5	nil	nil
,, 130 ,, ,,	21	2·6	4	0·66
,, 120 ,, ,,	57	7·1	32	5·3
Total	90	11	36	6·0
Respirations				
Above 40 per min.	48	6·0	nil	nil
,, 30 ,, ,,	119	15	88	14
Total	167	21	88	14

The development of the rash tended to "telescope," by which is meant that the full first phase was attained more rapidly and that the petechial stage developed earlier, the two phases running into each other. This is only an impression, and difficult to substantiate in a small series. Total duration of rash was about the same as in the untreated group.

Headache, prostration, and vomiting were absent or much less severe after treatment, and the patients themselves remarked on their subjective improvement. Mental confusion was absent in two treated cases, slight in three cases on one or two nights, and in the sixth case recurred at intervals over 14 days; the confusion was accompanied by urinary incontinence. One treated case developed severe hiccup on the ninth and tenth days (blood-urea on the ninth 60 mg. per 100 c.cm.); he recovered in spite of this usually fatal symptom.

The nursing staff, who cared for the whole series, all agreed that the treated group were much easier to nurse and were able to help themselves more readily and in a way that the untreated cases could never do at the same stage of the disease.

The attempt to use serum as early as possible led to its use in one case of typhoid fever and one of smallpox; this was regarded as an error in the right direction. The Weil-Felix reaction was unaffected by the serum.

Complications.—Bronchopneumonia was diagnosed in one patient who received serum and in one who did not; both responded to sulphapyridine with no undesirable side-effect. Deafness developed in five cases, of whom two had received serum; it did not persist for many days after defervescence. Several of the treated patients suffered from urinary retention; in only one was catheterisation necessary, and he developed cystitis which responded to sulphanilamide.

Serum rash was seen in five cases, appearing 10–14 days after the first dose and lasting about 3 days.

Convalescence was protracted in all cases, serum-treated and others. It has not been possible to determine whether the treated patients returned to work sooner than the rest. Convalescence should not, in the

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present state of knowledge, be hurried—one man, not treated with serum, after an early return to his unit developed persistent tachycardia with extrasystoles.

Mortality (see table II).—Of fourteen cases who did not receive serum five died. Of seven who received serum the only one to die was treated at a late stage and probably with inadequate dosage; he was in the age-group 35–39, as were three of the other fatal cases; only one in this age-group survived. Six cases, given serum in larger dosage, recovered.[1] The average day of death was 11·3.

Autopsy was performed on all fatal cases. The general findings included a fading petechial rash; the blood dark and fluid; the heart muscle soft and flabby; the spleen enlarged and diffluent. Three cases had early hypostatic pneumonia, and four had an apparent excess of cerebrospinal fluid with visible pressure effects.

ILLUSTRATIVE CASE NOTES (*see figure*)

Not Treated with Serum

4.—Age 23. One of the least severe attacks and the shortest duration of fever seen. Note "pseudocrisis" on 6th day. Weil-Felix positive OX19 on 9th day, 1 : 320.

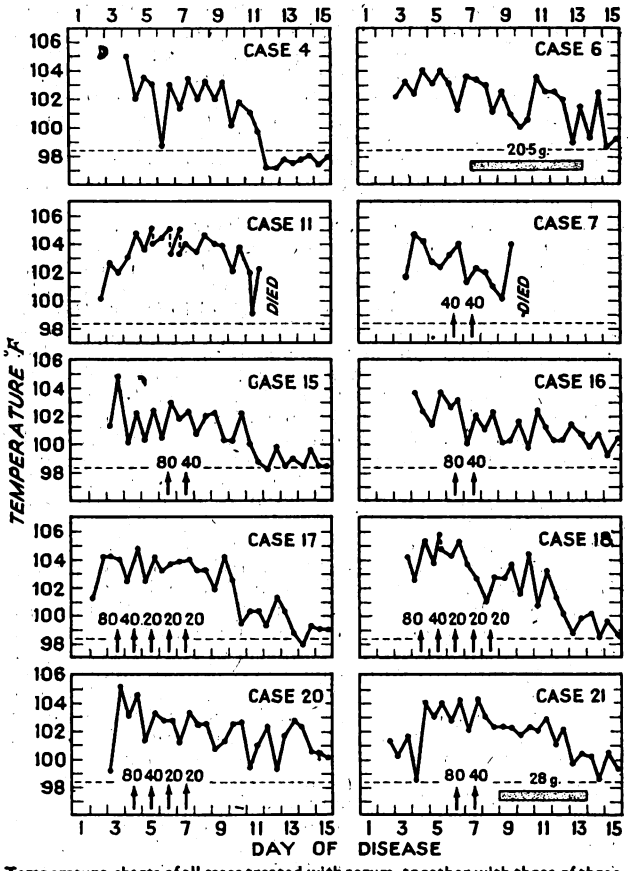
6.—Age 22. Seriously ill. Bronchopneumonia on 7th to 13th days. Weil-Felix positive OX19 on 15th day, 1 : 2560.

11. Age 30. Died 11th day. Weil-Felix negative throughout. Guineapig inoculated on day of death (12th) gave positive strain-isolation.

Serum-treated Cases

7. Age 38. Received serum intravenously, total 80 c.cm., on 6th and 7th days. Weil-Felix negative throughout. Guineapig inoculation gave positive strain-isolation on day of death (9th).

1. A seventh case was treated with similar dosage of serum from our supply at another military hospital in the area and is mentioned by courtesy of Lieut.-Colonel Everley Jones, RAMC; he recovered, but has not been included in this series.



Temperature-charts of all cases treated with serum, together with those of three cases not so treated—case 4, a straightforward recovery; case 6, complicated by bronchopneumonia, followed by recovery; and case 11, a fatal case. Arrows indicate administration of serum, with dose in c.cm. Stippled areas indicate administration of sulphapyridine, with total dosage.

TABLE II—MORTALITY BY AGE-GROUP IN SERUM-TREATED AND OTHER CASES

Age-group (yr.)	No. of cases	Treated with serum	Deaths	
			Not treated with serum	Treated with serum
20–24	6	2	0	0
25–29	5	1	1	0
30–34	5	3	1	0
35–39	5	1	3	1
Total ...	21	7	5	1

15.—Age 23. Serum, total 120 c.cm., on 6th and 7th days. Recovery. Weil-Felix positive OX19 on 9th day, 1 : 320.

16.—Age 22. Serum, total 120 c.cm., on 6th and 7th days. Recovery after very serious illness. Weil-Felix positive OX19 on 9th day, 1 : 160.

17.—Age 36. Serum, total 180 c.cm., on 3rd, 4th, 5th, 6th, and 7th days. Recovered. Weil-Felix positive OX19 on 8th day, 1 : 320.

18.—Age 34. Serum, total 180 c.cm., on 4th, 5th, 6th, 7th, and 8th days. Recovered. Weil-Felix positive OX19 on 15th day, 1 : 256.

20.—Age 22. Serum, total 160 c.cm., on 4th, 5th, 6th, and 7th days. Recovered. Weil-Felix positive OX19 on 10th day, 1 : 512.

21.—Age 33. Serum, total 120 c.cm., on 6th and 7th days. Complicated by bronchopneumonia, treated with sulphapyridine on 8th to 12th days. Recovered. Weil-Felix positive on 14th day, 1 : 256.

PATHOLOGICAL INVESTIGATIONS

White blood-cell count.—The highest count recorded was 14,800 on the third day (71% polymorphs, 27% lymphocytes, 2% mononuclears). The lowest figure was 3600 (differential not recorded). The average figure for the series taken on the 5th day was 8900 (polymorphs 71%, lymphocytes 26%, mononuclears 3%).

Three attempts to find *Rickettsial bodies* early, by sternal puncture, were unsuccessful.

Weil-Felix reaction.—Felix (1941) has stated that this reaction is positive in 75% of the cases on or before the 4th or 5th day of the illness, and that the maximum titres reached shortly before or after defervescence are very high. Other authorities (Findlay 1941, Megaw 1942) have stated that in most cases the reaction is positive before the end of the first week. In this paper it is proposed to accept a titre of 1 : 100 as significant and to confine the account to agglutinations with *Proteus* OX19 (although agglutinations with OX2 and OXK were carried out).

Not all cases were tested on the same day of the disease but the majority were tested on the 5th, 8th, and 12th days. The earliest readings over 1 : 100 were made in two cases on the 8th day. The average first positive was not obtained until 11·6 days. The first positive titres ranged from 1 : 160 (9th day) to 1 : 2560 (15th day). Details of subsequent rise of titre are omitted.

Three cases died without any significant rise in titre. The first of these died on the 9th day, with nil titre on the 5th and 9th days; the second died on the 12th day with titres of 1 : 40 on the 7th and 11th days; the third died on the 11th day with no rise in titre on the 6th and 9th days; autopsy of these three cases showed changes characteristic of typhus, and a positive strain-isolation was obtained from the blood of two of them.

Rickettsial agglutinations were performed by Major C. E. van Rooyen, RAMC, on the serum from six cases. All gave a high-titre response of epidemic type.

Guineapig inoculations were performed in six cases, five of which produced a positive strain-isolation.

Urine.—Febrile albuminuria was the rule, and persisted in one case only, the man who developed cystitis. Hyaline or granular casts were seen in a third of the series.

Cerebrospinal fluid.—Lumbar puncture was performed in three cases in the pre-eruptive stage. The fluid was clear, colourless, at a pressure within normal limits; cells numbered less than 5 per c.mm.; protein ranged from 35 to 45 mg. per 100 c.cm. There was no increase of globulin.

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SUMMARY

Twenty-one cases of louse-borne typhus fever were treated at a military hospital in the Middle East in 1943.

Antityphus serum (Lederle), supplied by the US Army medical services for clinical trial, was used in seven cases.

Six cases were given large doses of serum as soon as clinical diagnosis was established and all recovered. A seventh case, given a smaller dose, died.

No attempt is made to draw conclusions from so small a series, but reasons are given for believing that the serum has a beneficial effect by modifying the severity of the course and reducing the toxæmia.

Emphasis is placed on giving the serum as early as possible and in adequate dosage.

I offer my thanks to Colonel W. Russell, MC, lately commanding officer of the hospital where these cases were seen, for permission to publish this paper; to Brigadier-General L. A. Fox, field director, USA Typhus Commission, whose generous supply of serum made this work possible; to Lieut.-Colonel J. C. Hawksley, RAMC, for his stimulating advice and assistance; to Captain W. R. Gauld, RAMC, for the notes on one case; to Major G. C. K. Reid, RAMC, for the pathological investigations; and to Miss B. M. Currie, TANS, and the other members of the nursing staff.

REFERENCES

Dickie, G. (1943) Personal communication.
Felix, A. (1941) *Proc. R. Soc. Med.* **35**, 160.
Findlay, G. M. (1941) *Ibid*, **35**, 157.
Mackenzie, M. D. (1941) *Ibid*, **35**, 141.
Megaw, J. W. D. (1942) *Brit. med. J.* ii, 401, 433.
Memoranda on Medical Diseases in Tropical and Sub-Tropical Areas, London, 1941. HMSO.

EFFECT OF TEMPERATURE ON ISOAGGLUTINATION IN BLOOD-GROUPING

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IT is generally accepted that isoagglutination by human anti-A and anti-B agglutinins is stronger at room or refrigerator temperatures than in the incubator. Hence the usual recommendation is to read blood-grouping tests performed in tubes after two hours at room temperature (MRC 1943). According to Hara (1930), however, there is no essential difference between typing blood at 37° C and in the refrigerator, though agglutination after one hour sometimes appears stronger at the higher temperature. Kettel (1928, 1930), while finding that the titre of isoagglutinins increases with fall in temperature, also stated that at higher temperatures the maximum titre is reached earlier, though agglutination may disappear more quickly than at lower temperatures. In most experiments the results were read after the tubes had stood for some hours; no observations were made after the shorter periods often adopted in testing blood groups. Accordingly this point has been investigated here.

Suspensions containing 1–1·5% of red cells in 0·9% saline were prepared from the clots of blood samples sent to the department for the Wassermann test; 1 vol. of suspension was mixed with 1 vol. of serum (O, A, and B) or serum dilution and sometimes 1 vol. of 0·9% saline was added also. The sera used had previously been heated to 55° C for half an hour. Sera and cell suspensions were kept separately at the required temperatures for 20 min. before mixing. Those mixtures to be kept at the lower temperature were made just before the mixtures in the incubator, but the results of the latter were read before the former. In this way conditions were favourable to agglutination at the lower temperature; hence results in favour of incubation are more definitely proved.

Agglutination usually occurred more rapidly in the tubes kept at 37° C than in those at room temperature or in the refrigerator. The first readings (after 5–15 min.) nearly always showed coarser agglutination at 37° C, especially in the tubes containing the greatest amounts of serum, independently of whether O sera or A and B sera were used; 64 out of 68 sera examined on titration behaved in this way. Exceptionally agglutination was quicker at room temperature than in the incubator. After 1 hour there was no significant difference in the readings or often agglutination was greater at the higher temperature. The reading after 2 hours usually showed the highest titres at room temperature, though the differences were small; occasionally the opposite was observed. The table gives representative observations.

Thus the final agglutination may be considered the resultant of two influences which are affected in opposite ways by temperature and which may vary according to the individuality of different sera and cell suspensions.

CONCLUSIONS

The agglutination of A and B red cells by O, A, and B sera at different temperatures has been investigated. The reaction is usually quicker if the tubes are incubated at 37° C than if they are kept at room temperature or at 2–3° C. The end titres, when read after 2 hours, may be the same at higher and lower temperatures, or the end titre at 37° C may be somewhat lower, as is generally accepted.

The incubation method is of practical value as a means of avoiding false positive results due to cold agglutination or panagglutinability and polyagglutinability of the red cells. This is particularly true when red cells alone are grouped without examination of the serum—and in small laboratories, which do not possess a stock of standard red cells, grouping of the red cells alone is the procedure regularly followed. For the incubation method tubes should be used, since there would be too much evaporation from slides unless special precautions were taken.

My thanks are due to Prof. H. Sachs for his suggestions and to Prof. R. A. Q. O'Meara for the facilities of the department of bacteriology; also to the Medical Research Council of Ireland for a personal grant.

REFERENCES

Hara, K. (1930) *Z. ImmunForsch.* **67**, 174.
Kettel, K. (1928) *Acta path. microbiol. scand.* **5**, 306. (1930) Undersgelser overKuldenhaemagglutininer i Menneskeserum, Copenhagen.
Medical Research Council (1943) Determination of Blood Groups. War Memo No. 9.

AGGLUTINATION OF GROUP A RED CELLS BY GROUP B SERUM AT VARIOUS TEMPERATURES READ AFTER VARIOUS INTERVALS

0·1 c.cm. serum diluted	At 37° C			At room temperature			In refrigerator		
	10–15 min.	1 hr.	2 hr.	10–15 min.	1 hr.	2 hr.	10–15 min.	1 hr.	2 hr.
1 : 1	++++	++++	++++	+++	++++	++++	++	+++	++++
1 : 2	+++	++++	++++	++	++++	++++	+	+++	+++
1 : 4	++	+++	++++	+	+++	++++	−	++	+++
1 : 8	+	+++	+++	−	+++	+++	−	++	++
1 : 16	±	++	+++	−	++	++	−	+	++
1 : 32	−	+	++	−	+	++	−	±	+
1 : 64	−	−	−	−	−	+	−	−	−
No serum	−	−	−	−	−	−	−	−	−

The number of + signs indicates the strength of agglutination.

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RADIOTHERAPY IN OSTEOCLASTOMA

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OSTEOCLASTOMA was divided by Kirklin (1932) into two radiological types, the trabeculated and the osteolytic, which he said occur in almost equal numbers. The trabeculated form, or giant-celled tumour, is well known, but the osteolytic form is seldom mentioned.

Geschickter and Copeland (1936), in their account of osteoclastoma, say that trabeculation disappears as the lesion advances, thus giving rise to the osteolytic picture. Jansson (1937) sees no reason for diagnosing two types; he holds that the osteolytic type is only a more advanced form, and he describes 3 cases developing from trabeculated into osteolytic. Brailsford (1937) agrees with this view. Herendeen (1932), however, considers that the radiological picture depends on the rate of growth. Rapid growth produces an osteolytic picture, while a tumour growing more slowly appears trabeculated.

It is still uncertain, therefore, whether there are two distinct types, or merely two stages in one disease. The following cases of the osteolytic stage or type illustrate the difficulty of differential diagnosis and also show the appearance of trabeculation as a response to irradiation. Two of the tumours were in the lower end of the femur, and one in the lower end of the radius; these two sites are common in both types of osteoclastoma, which usually involve both epiphysis and metaphysis.

CASE-RECORDS

CASE 1.—A woman aged 37 was admitted in 1936 with a history of 6 months' pain and stiffness of the left leg. About 3 months before admission she had twisted her knee, since when it had been swollen. She looked well nourished, and general examination revealed nothing abnormal. The left knee-joint and lower end of the femur showed a fusiform swelling: movements were limited, and there was slight wasting of the leg muscles. The skin over the swelling was tense though not red. There was local rise of temperature, but no pulsation; the swelling was hard, but there was no egg-shell crackling. No enlarged glands were palpable in the left groin. The blood-count was normal and the Wassermann reaction negative.

X-ray examination in May, 1936, showed an asymmetrical, globular, rarefied area on the outer side of the lower end of the femur involving epiphysis and metaphysis; it extended into the soft tissues along its outer margin, but not into the joint cavity (fig. 1). The expanded bony shell of the tumour was extremely thin and was absent in one part. There was only a very small projection of the cortex of the shaft into the tumour area, but marked lipping of the periosteum. The central portion of the tumour was rarefied, and no strands of bone were seen crossing it, but a small area of the bone surrounding the rarefaction had a foam-like structure. The tumour was nowhere sharply demarcated from adjacent bone on the shaft side.

Sarcoma had been diagnosed, but on admission this diagnosis was changed to osteolytic osteoclastoma. Amputation had been suggested, but it was agreed to try irradiation. X-ray treatment was begun in May, 1936. At first the swelling grew more tender and increased in size, as is usual in these cases, but by the end of the 6-weeks course the patient was free from pain. Serial radiograms over the next 3 months showed steady enlargement of the rarefied area,[1] disappearance of the marginal sponge-like structure, and absorption of almost all the cortex along the lateral margin. Then the swelling began to subside, but movement remained extremely limited.

During the next 5 months recalcification began. At first several pin-point opacities were seen in the rarefied area; this was followed by haziness of the whole tumour; and later several fine strands became visible. The cortex gradually became re-established, and the whole tumour assumed a sponge-like architecture (fig. 2). Coarse strands were then laid down somewhat irregularly throughout the foam-like structure, and a firm buttress of bone was seen at the site of the periosteal lipping. The appearance 22 months after treatment began to resemble that of a trabeculated osteoclastoma.

1. Brailsford (1943) in a paper published since the above was written has also emphasised this point.

During the next 4 years recalcification continued (fig. 3). Though the patient was walking easily without a calliper a year after treatment, full range of movement at the knee returned only gradually. Seven years after treatment she was in good health and free from disability. The skin in the irradiated areas was epilated, but it showed no atrophy or telangiectasis.

Although a biopsy was not obtained in this case, its radiological similarity to case 2 (which was proved histologically) and its response to irradiation confirm the diagnosis.

CASE 2.—A woman of 23 was admitted in 1941, having had pain in the right knee for 4 months. This was attributed to rheumatism, but as there was no response to treatment she was sent to hospital. On general examination nothing abnormal was found. The right knee-joint and lower end of the femur were swollen and movement was limited. The swelling was firm, but there was no eggshell crackling, and

Fig. 4—Case 2: section of tumour at lower end of femur, showing typical osteoclastoma.

no reddening of overlying skin. The local temperature was raised and there was pulsation. The knee-joint contained a large effusion. No enlarged glands were found in the right groin, and radiography of the chest showed no abnormal shadows. The radiogram of the lower end of the right femur was exactly similar to that of case 1, except that the tumour involved the medial condyle of the femur and there was no foam-like appearance round the rarefied area, but there was gradual diminution of the density of the shaft towards the rarefied area. The periosteum was lipped, and largely because of this a diagnosis of osteolytic osteogenic sarcoma had been made. Biopsy, however, revealed the true nature of the tumour—a typical osteoclastoma (fig. 4).

X-ray treatment was begun in February, 1941. The course lasted 6 weeks. Serial radiograms showed a response similar to that in case 1. An initial apparent increase in the size of the tumour was followed by gradual recalcification which is still progressing, but has not yet reached the stage seen in case 1. Movement of the knee is not yet full.

CASE 3.—A woman of 37 was admitted in 1932 because of 5 months' swelling of the right wrist, with slight pain. She appeared otherwise healthy. The dorsum of the wrist showed an ill-defined swelling at the level of the radial styloid process, but the flexor aspect was unaffected. The skin over the swelling was normal but it was tender on firm pressure and fluctuation was felt. Flexion and extension of the wrist were both somewhat limited; movements of the fingers were normal. Radiography in November, 1932, showed a globular rarefied area asymmetrically placed on the medial side of the lower end of the radius involving both epiphysis and metaphysis, but without extension into the joint cavity (fig. 5). The expanded bony shell of the tumour

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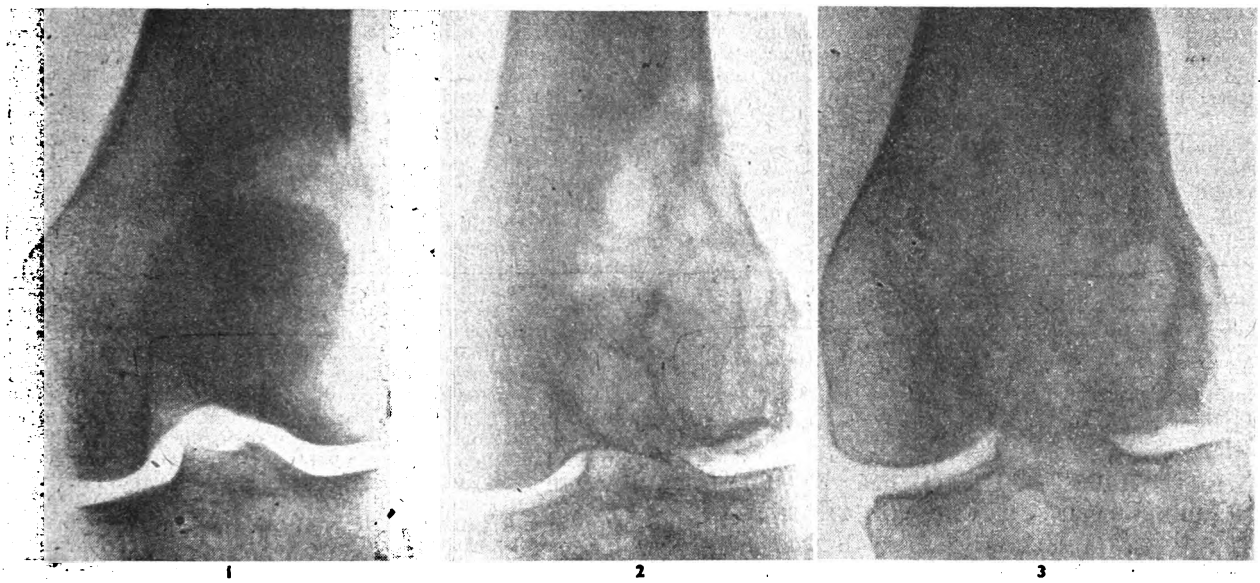

Fig. 1—Case 1, May 5, 1936: osteolytic osteoclástoma at lower end of femur showing periosteal lipping, which at first led to a diagnosis of sarcoma.

Fig. 2—Case 1, Jan. 1, 1937: after irradiation, showing appearance of trabeculæ during recalcification.

Fig. 3—Case 1, May 6, 1940: showing amount of recalcification 4 years after irradiation.

was extremely thin and was perforated at one point. Along the medial border, the cortex of the shaft projected into the tumour area. The central portion of the tumour was rarefied, but faint clear-cut trabeculation was visible around its margins. There was no sharp demarcation of the tumour area from the adjacent bone, and no periosteal lipping.

Osteoclastoma was diagnosed radiologically, and X-ray treatment began in November, 1932. The response (fig. 6) was similar to that seen in cases 1 and 2. Owing to insufficient support of the wrist during the rarefying process after irradiation, the thin bony wall fractured and there was slight collapse of the distal end of the radius. The patient was able to use the hand normally within a year, although slight limitation of supination persisted. X-ray examinations showed that the involved area continued to grow in density throughout the next 10 years. The patient remains well 11 years after treatment.

Since none of these patients were under observation before they were sent for treatment, there are no serial films to show whether trabeculation preceded osteolysis. If such films had been available, the diagnosis would have been simple. But actually in 2 of these cases, the diagnosis from osteolytic sarcoma was very difficult both clinically and radiologically.

DISCUSSION

Kirklin states that there is no evidence of "periosteal irritation" in osteoclastoma. Brailsford and others hold the same view. Periosteal lipping has been usually taken as one sign among others that a bone tumour is sarcomatous, and in cases 1 and 2 a diagnosis of sarcoma was made by the surgeon because such periosteal reaction was observed. The biopsy in case 2 proves, however, that lipping can be seen in osteoclastoma as well as sarcoma. This point, which is of considerable importance, does not seem to have been previously noted.

Coley (1930) stated that in 1 case out of every 4 at the Memorial Hospital, New York, a correct diagnosis could not be made without biopsy. The tendency was to mistake a malignant condition for a benign.

Although both sarcoma and osteoclastoma may show a central destructive lesion with a peripheral osteogenesis (periosteal lipping), the character of the tumour margin on the shaft side often differs in the two. In a sarcoma the adjacent bone has an irregular appearance, which has been described as moth-eaten; whereas in osteoclastoma it may be foam-like (i.e., a more regular structure round the margin, as in case 1), or the density of the shaft may gradually diminish towards the tumour area as in case 2, or there may be faint clear-cut trabeculation as in case 3. Where biopsy is impossible, diagnosis may be helped by the response to irradiation. About 12 weeks after treatment of an osteoclastoma (as demonstrated in these 3 cases), radiograms show early calcification. This recalcification proceeds and trabeculation reappears in the rarefied area, giving the appearance of a trabeculated osteoclastoma. The trabeculæ are, however, less clear-cut than in an untreated case, and the loculi between the strands are somewhat hazy. In sarcoma and in metastatic deposits, on the other hand, recalcification does not usually show honeycomb formation.

These 3 cases demonstrate that radiotherapy can give a satisfactory result in osteolytic osteoclastoma; and cases of the trabeculated type have shown an equally good response, with no recurrence. Formerly most cases of this kind were treated by surgery, but Pfahler and Parey (1932) believe that irradiation is definitely superior. Ewing (1932) states that while there are rare cases of osteoclastoma in which amputation may

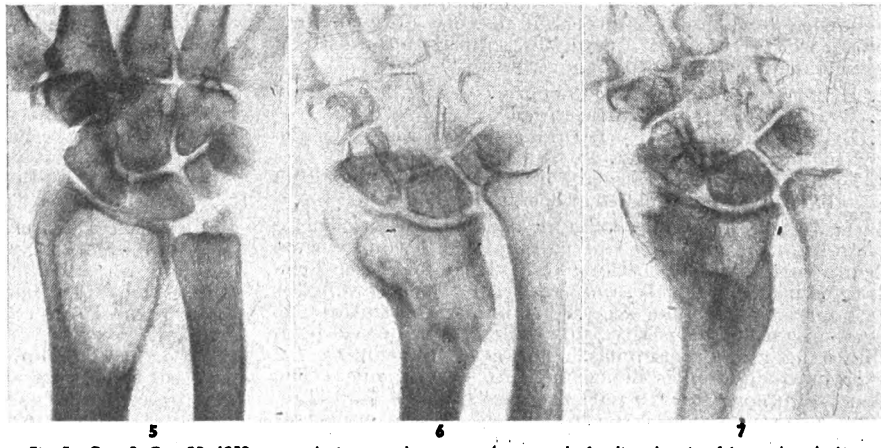

Fig. 5—Case 3, Oct. 22, 1932: osteolytic osteoclastoma at lower end of radius showing faint trabeculation around the rarefied area.

Fig. 6—Case 3, June 26, 1933: after irradiation, showing appearance of trabeculæ during recalcification.

Fig. 7—Case 3, Jan. 16, 1941: showing amount of recalcification 9 years after irradiation.

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have to be done (e.g., very large tumours, very vascular tumours and those with malignant change), surgery should generally be avoided. Bad surgical results he had seen included recurrence, infection and malignant transformation.

SUMMARY

Three cases of osteolytic osteoclastoma are reported. Two of these showed the periosteal lipping generally considered pathognomonic of sarcoma. Under irradiation treatment the tumours developed trabeculation. The clinical response was good.

REFERENCES

Brailsford, J. F. (1937) *Brit. J. Radiol.* **10**, 171; (1943) *Lancet*, **i**, 776.
Coley, W. B. (1930) *Amer. J. Surg.* **8**, 122.
Ewing, J. (1932) *Amer. J. Roentgenol.* **28**, 189.
Geschickter, C. F., Copeland, M. M. (1936) Tumours of Bone, New York.
Herendeen, R. E. (1932) *Amer. J. Roentgenol.* **28**, 189.
Jansson, G. (1937) *Acta radiol., Stockh.* vol. XVIII. Fasc. 1–2.
Kirklin, B. R., Moore, C. (1932) *Amer. J. Roentgenol.* **28**, 145.
Pfalher, G., Parry, L. (1932) *Ibid*, **28**, 151.

MENINGITIS DUE TO PS. PYOCYANEA

PENETRATING WOUNDS OF THE HEAD*

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PENICILLIN has affected the problem of infection in cerebral war wounds, for meningitis due to penicillin-sensitive organisms seldom ends fatally; no such fatal case has occurred here since the advent of penicillin therapy. At the same time, cerebral infection with gram-negative penicillin-resistant organisms remains a hazard. The purpose of this paper is to review the clinical and pathological findings in 11 cases of meningitis due to *Ps. pyocyanea* and to discuss the probable pathogenesis of the disease in the various cases.

Between June 8 and Aug. 20, 1944, some 400 patients with head wounds were evacuated from France to this hospital. During this period there were 22 deaths, 8 of them due to *Ps. pyocyanea* meningitis. Three additional cases occurred during the period under consideration, 1 of which has since proved fatal. Of these 11 patients, 9 had infected wounds communicating with the subarachnoid space or with the ventricle. Of the remaining 2 cases, 1 was an apparently uncomplicated penetrating wound of the brain and the other a perforating wound without brain abscess.

From June 8 to about July 20, 1944, patients were evacuated from France by devious routes, mainly by sea, arriving at this hospital 3–5 days after wounding. After July 20 most patients were evacuated by air and arrived more quickly.

PENICILLIN

Before June 20, 1944, patients with infected head wounds, as manifested by the presence of liquid pus, yellowish purulent exudate, and necrotic foul-smelling brain, were treated with penicillin solution administered by one or more of the following routes—

1. By intramuscular injection 3-hourly.
2. By injection into lumbar theca daily.
3. By instillation 6–12-hourly through a rubber tube remaining in the head wound.
4. By injection with syringe and needle into the wound after the scalp had been closed at operation.

After June 20 no rubber tube for the instillation of penicillin solution was placed in a wound. All wounds were firmly sutured at operation; only 2 wounds have been drained postoperatively, and then with a Penrose tube for 24 hours. With some exceptions, penicillin solution has been given intrathecally only when there have been clinical signs of meningitis. The cases developing *Ps. pyocyanea* meningitis hence fall into two groups. The first group consists of 9 patients (cases 1, 2, 4, 5, 6, 7, 9, 10, 11) treated before June 20. The second group (cases 3 and 8) occurred after June 20 and consists of 2 patients with brain abscesses.

Between June 8 and Aug. 20, 74 patients received penicillin solution intrathecally or by local intracranial administration. The figures are shown in table I.

The question arises: Could the solution of penicillin injected intrathecally or instilled locally have been contaminated with *Ps. pyocyanea*? All penicillin was dispensed with sterile technique by the pathological laboratory, using an automatic dispenser, and daily bacteriological check of samples passed through the dispenser was negative. At first penicillin for intramuscular and intrathecal use was dispensed in 60–100 c.cm. amounts at a strength of 5000 units per c.cm. Solutions for local instillation were made up in similar quantities at a strength of 1000 units for several patients. Following recognition of the early cases of *Ps. pyocyanea* meningitis, all bottles in use as penicillin containers were recalled from the wards to the pathological laboratory. All were sterile on culture. From that time penicillin was dispensed in 20 c.cm. amounts for intramuscular use, and in 10 c.cm. amounts for intrathecal use, an individual bottle being reserved for each patient. For a period of 20 days sterility tests were done on every bottle before issue and after return from the wards. All were sterile on issue. The dregs of two bottles which had contained penicillin solution at a strength of 1000 units per c.cm. (only one of these was returned from a neurosurgical ward) yielded *Ps. pyocyanea* on culture. No change in the technique of dispensing penicillin had been made, save that, towards the end of the 20-day period, penicillin solution for intrathecal use was Seitz-filtered and this has been continued.

From these facts it was concluded that wholesale contamination of penicillin solution was unlikely. If this was occurring it could reasonably have been expected that some of the patients receiving penicillin intramuscularly would have shown signs of infection. It is known that the intramuscular injection of penicillin solution heavily contaminated with *Ps. pyocyanea* may produce red indurated extremely painful areas at the sites of injection, with fever up to 105° F and prostration (Magner 1944). Nothing like this happened here. Furthermore, 2 patients who developed meningitis received penicillin solution which bacteriological tests had proved sterile before use, and the residue in the containers was also proved sterile after return from the wards. Nevertheless, the method of handling penicillin at the beginning is open to criticism, and in 2 cases, to be considered later, we believe that contaminated penicillin solution may have been responsible for the meningitis.

TABLE I—ROUTES OF PENICILLIN ADMINISTRATION IN 74 CASES OF HEAD INJURY

Penicillin	Number of cases	
	June 8 to 20	June 21 to Aug. 20
Intrathecal only	9	23
Intrathecal plus local instillations by tube	22	0
Intrathecal plus local injections at operation	..	8
Local injections at operation only	..	12

All patients received intramuscular penicillin.

SURGICAL TECHNIQUE

The neurosurgical wards were staffed with experienced and highly trained nursing sisters. The specific problem of cross-infection with gram-negative organisms in relation to penicillin therapy, as since emphasised by McKissock and others (1944), had been discussed with them before D-day. They had long followed the general principles involved in the prevention of cross-infection, and a dressing technique had been established during the previous four years which had given rise to no difficulty. The procedure regarding dressings was carried on as before D-day. Instruments, syringes, needles, and dressings were sterilised by autoclaving and delivered to the wards in small bundles for individual patients. Masks with 'Cellophane' inserts were worn. Gloves were not worn but hands were washed and "no-touch"

* Read at a meeting of the Society of British Neurological Surgeons on Nov. 4, 1944.

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TABLE II—CLINICAL, BACTERIOLOGICAL, AND AUTOPSY FINDINGS IN 11 CASES OF MENINGITIS

Case	Admitted	Clinical summary	Penicillin			Meningitis		Wound cultures		Autopsy
			Local	Intrathecal	Intramusc.	Onset	Duration (days)	On admission	Later	
1	June 10	Cranio-facial-orbital wound with CSF leak. Incomplete opn elsewhere. Infected wound on admission. Removal of eye; packing; penicillin tube. After onset of meningitis, radical debridement and packing	+ T	+	+	9 days after removal of eye	15	No growth from eye socket	Tube and wound: *Ps. pyocyanea* 2 days before meningitis	Laceration and softening both frontal lobes, not communicating with ventricle
2	June 9	Cranio-facial-orbital wound. Eye removed. General debridement. Packing and tubes	+ T	+	+	9 days post op	14	*Staph. aureus*	Tube and wound: *Ps. pyocyanea* 2 days before meningitis	Laceration and softening both frontal lobes, communicating with ventricle
3	July 19	Left temporal penetrating wound. Large metallic FB retained in midline. Incomplete removal of damaged brain. Patient reopened wound. Serous discharge (CSF?), healed. Brain abscess. Subarachnoid space opened at opn on abscess	..	+ C	+ C	2 days after drainage of abscess	77	Extruding brain: *Staph. aureus* and coliforms	Opn for abscess: no growth from pus. *Ps. pyocyanea* on day of onset of meningitis	Large abscess left frontal lobe, communicating with ventricle
4	June 12	Frontal parasagittal penetrating wound with bone fragments crossing midline below falx. Incomplete opn elsewhere. Wound infected. CSF leak on 5th day after opn	+ T	+	+	5 days after 2nd opn	10	*Staph. aureus*	Coliforms from wound on day of onset meningitis	Deep laceration of frontal lobe, communicating with ventricle
5	June 19	Parasagittal parietal penetrating wound; large fungus. Incomplete opn elsewhere. Infected on admission. Multiple bone fragments. Debrided, packed. (Infective cerebritis)	+ T P	+	+	3 days after 2nd opn	3	*Staph. aureus*	*Ps. pyocyanea* after meningitis	Deep laceration, communicating with ventricle
6	June 12	Penetrating temporal wound. Opn elsewhere. Herniating brain on admission. Subdural pus and multiple deep abscesses. Radical debridement and packing	+ T P	+	+	1 day after opn for multiple abscess	30	*Staph. aureus* and *Strep. viridans*	*Ps. pyocyanea* after meningitis	Large brain defect; small abscess in left parietal lobe communicating with ventricle
7	June 18	Left occipito-mastoid wound, brain extruding. Wound infected. At opn subdural spaces widely opened	+ N	+	+	2 days after opn	23	*Staph. aureus* and *Ps. pyocyanea*	..	Recovered
8	July 6	Penetrating parietal wound. Opn elsewhere. On admission gas-containing abscess. Extruding brain. Meningeal reaction. Multiloculated abscess and softened infected brain removed. Subarachnoid space opened. Wound packed	..	+ C	+ C	7 days after drainage of abscess	42	Non-hæm. strep. and *Staph. aureus*	..	Recovered
9	June 16	Penetrating wound left cerebellum to right parietal lobe. Opn elsewhere. Infected wound. Brain presenting	..	+	+	4 days after admission	18	*Staph. aureus* in opn wound (entry)	..	Small track of liquid purulent material leading from track of missile into ventricle
10	June 13	Penetrating left frontal wound. Incomplete opn elsewhere. Brain extruding. Debridement. Tube extradural	+ T	+	+	6 days after opn	20	*Staph. aureus*	*Ps. pyocyanea* after meningitis	Laceration left frontal lobe. Well walled off. No communication with ventricle
11	June 12	Penetrating wound left cerebellum to right parietal lobe. Left eye removed on admission; 6 days later 500 polys per c.mm. in CSF. Retention of urine with overflow. 3 days IT penicillin; 40 polys per c.mm. in CSF. 14 days after admission pineal shift to left. Subdural hygroma, soft brain, and metallic FB removed. 3 days later onset acute purulent meningitis	..	+	+	3 days after evacuation of subdural hygroma	3	Coliforms from healing wound of entry	..	Small healed entrance wound. Narrow track of necrotic tissue through cerebellum to right parietal lobe. No communication with ventricle or area of deep sepsis

T = tube; P = packing; N = needle; C = controlled.

technique carried out. For a period (June 8–20) tubes were left in infected cerebral wounds to allow the instillation of penicillin. These wounds were dressed with tullegras, 'Pliofilm,' and gauze, and the tubes, plugged with wooden applicators, were brought out through the dressings. The tubes were covered with sterile gauze so arranged as to form a flap which could be lifted by the nursing sister without contaminating the tube. At the time of injecting penicillin, tube and applicator were handled with sterile forceps.

'Cetavlon' was used extensively for its detergent and cleansing effect. This may have been a factor in allowing the growth of *Ps. pyocyanea* where it was not followed by alcohol or iodine, for cetavlon was later found to be ineffective against this organism. Though no specific break in surgical technique has been discovered the possibility remains that, under the pressure of work, minor relaxations may have occurred, despite the conscious effort of all concerned to maintain standards. Potent factors favouring air-borne cross-infection were that the wards were filled and the beds of necessity were situated close together. A bacteriological air-check carried out on all wards during this period of maximum activity showed that *Ps. pyocyanea* was air-borne in three of the wards to which these casualties were admitted.

In the operating-rooms there was no deviation from the established technique. Caps, masks, gowns, drapes, and gloves were available at all times.

ANALYSIS OF CASES

Consideration of the pertinent clinical, bacteriological, and pathological data concerning each case is necessary to evaluate the factors responsible for the development of meningitis. At autopsy the meningeal exudate was constantly found over the base of the brain. In most cases a mat of pale yellow fibrinopurulent exudate extended posteriorly from the region of the optic chiasma in the basal cisterns, sweeping over the pons and anterior surfaces of the cerebellar hemispheres, down the medulla

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oblongata and spinal cord. The ependyma of the ventricles was coated with a thick slimy yellowish exudate in every case whether or not the cerebral wound communicated with the ventricular system. The significant findings in each of the cases are summarised in table II.

In 3 instances (cases 1, 2, and 7) *Ps. pyocyanea* was grown on culture of the wound shortly before the development of clinical signs of meningitis. However, *Ps. pyocyanea* was cultured from the wound of 1 patient (case 3) on the day of onset of meningitis, and in 1 case (4) "coliforms" were recovered. In every case cultures of the cerebrospinal fluid repeatedly yielded *Ps. pyocyanea*, and the organism was grown on culture of the subarachnoid space at autopsy in the fatal cases. In most instances the organism was readily recognisable on blood-agar plates by the typical greenish fluorescence and sweetish odour. A few strains were achromogenic and might have been confused with other organisms of the coliform group. Repeated subculture and fermentation reactions allowed positive identification of the organism in each case.

Group 1.—Cases 1–9 should be considered as a group for in every instance communication between wound and subarachnoid space or ventricle was verified. Of these 9 patients, 5 (cases 1, 2, 4, 5, and 7) were admitted with clinically infected wounds, case 5 having in addition a cerebral fungus. A tube for the local instillation of penicillin was used in 4 patients (1, 2, 4, and 5). In the 5th case (case 7) *Ps. pyocyanea* was grown on culture of the temporal muscle, which, after operation, was in contact with the cerebrospinal fluid. In cases 1, 2, 4, and 5 it is believed that hospital cross-infection was responsible for the infection of the head wound with *Ps. pyocyanea*. In each case the wound was kept open by a rubber tube. In these cases, and in case 7, in which *Ps. pyocyanea* was present in the wound on admission, it seems probable that extension of infection from the superficial parts of the wound to the subarachnoid space or the ventricle was the cause of the meningitis.

Of the 4 cases unaccounted for (3, 6, 8, and 9) 2 were admitted with cerebral abscesses (6 and 8), one (3) developed an abscess postoperatively in hospital, and in one case (9) an abscess was found at autopsy. One case (8) had a postoperative gas-containing abscess almost certainly associated with a mixed infection. The development of *Ps. pyocyanea* meningitis followed the change of packing on the seventh day after operative drainage of the abscess, and this may have disturbed the adhesive barrier between abscess cavity and subarachnoid space. It seems probable in this case that infection with *Ps. pyocyanea* was present from an early date. In case 6, multiple deep abscesses and subdural pus were producing cerebral herniation on admission. An incomplete operation had been done elsewhere. Meningitis developed the day after operation here and is attributed to infection present before admission.

Primary operation in case 3 was incomplete, for a large missile crossed the midline and a substantial amount of necrotic brain was inaccessible. Cultures taken from extruding brain before operation grew "coliform" organisms and *Staphylococcus aureus*. During convalescence the patient succeeded in reopening the wound. An indolent cerebral abscess developed and at operation the subarachnoid space was opened accidentally. Meningitis followed 2 days later. It is impossible to decide whether the organisms present on admission, or infection introduced when the wound was reopened, is responsible for producing the brain abscess.

In case 9 the projectile had caused a long track of softened brain tissue, uninfected save in one area. From this focus of infection there had been extension through cerebral tissue directly into the ventricle. It is thought that in this case infection occurred early with later deep spread to the ventricle.

Group 2 includes the remaining 2 cases (10 and 11) for which an explanation of the meningitis is more difficult to establish. In one case (11) the patient showed evidence of a meningeal reaction on admission, and 7 days later, after evacuation of a subdural hygroma, developed full-blown meningitis. Autopsy failed to show a focus of subdural or intracerebral sepsis. It appears therefore that the meningitis may have been due to the lumbar intrathecal introduction of contaminated penicillin. This explanation also seems likely in case 10, in which a penetrating frontal wound was well walled off from the subarachnoid space and there was no communication with the ventricle or focus of deep sepsis.

DISCUSSION

Ps. pyocyanea is well recognised as a common secondary invader of open wounds in surgical wards. It may be found in soil and water and in the intestinal contents of man and animals. Hence it is a not uncommon contaminant of war wounds. Working at a base hospital, Ross and Magner (1944) found gram-negative organisms in 98 out of 365 cultures from wounds received in the Sicilian campaign. In half of these 98 cultures the infecting gram-negative organism was *Ps. pyocyanea*. The organism, being penicillin-resistant, may flourish in wounds, and in the subarachnoid space, from which gram-positive organisms have been eliminated by penicillin. In a series of 23 penetrating cerebral wounds reviewed by Cairns (1944), Scott Thomson found *Ps. pyocyanea* in 5 wounds before treatment and in 13 after a few days of treatment using local penicillin tubes. Cairns believed that "gram-negative pus" was harmless in brain wounds provided it had free exit from the wound, but he pointed out that final decision awaited further experience, since organisms of the coliform group were not necessarily harmless in CSF pathways, and if pus were to leak into the ventricle severe consequences might arise. The findings in our 11 cases provide a final decision. Cerebral wounds infected with *Ps. pyocyanea* cause meningitis if a communication exists with the subarachnoid space or the ventricular system even though adequate drainage to the exterior exists.

At the same time, evidence indicates that where complete debridement has been achieved cerebral tissue is resistant to infection with gram-negative organisms. Among 94 cases of penetrating cerebral wounds in which positive cultures were obtained, organisms of the coliform group were found in 25. These 25 patients received primary definitive surgical treatment at this hospital with complete closure of the wound. In 23 cases debridement was regarded as efficient and primary healing took place. In 1 case (case 7 of this series) infection of the subarachnoid space is believed to have occurred from infected temporal muscle. Incomplete debridement was carried out in the remaining case (case 3) and a postoperative cerebral abscess developed. The patient also reopened his wound.

Complete closure of the scalp in all cases of penetrating war wounds of the head is of great importance, especially when wards are filled with battle casualties. The use of a tube for instilling penicillin holds open a channel from the surface to the cerebral wound, and the surfaces of the tube provided a bridge along which organisms may spread. In 3 (nos. 1, 2, and 4) of the 6 cases (1, 2, 4, 5, 6, and 10) in this series in which a local penicillin tube was used, it has been judged the factor determining the intracranial spread of infection due to *Ps. pyocyanea*.

It is to be noted that 4 cases (nos. 1, 4, 5, and 10) had been incompletely operated on elsewhere, and on arrival required a second operation to complete debridement. This inevitably increases the risk of infection. Penetrating wounds involving the brain should be operated on but once and then completely and with closure of the wound.

Penicillin was given intramuscularly before operation and for approximately a week thereafter in all cases of penetrating wounds, with a booster dose during operation. It is believed, though no specific proof is available, that the blood-brain barrier is damaged by a cerebral wound or by operation, and that penicillin in the blood does gain access to the cerebral wound.

In addition to penicillin therapy all patients received 1–3 g. of sulphadiazine on admission to hospital and 1 g. every 4 hours thereafter for 6–10 days or until it was considered that risk of infection had passed. In the group of cases under discussion larger dosage of sulphadiazine and sulphapyridine produced no apparent effect on the progress of the meningitis in 9 cases. On the suggestion of Captain L. L. Bernstein, a member of the neurosurgical staff, 3 cases received in addition repeated injections of sodium iodide intravenously. One patient died after a protracted course. Two patients recovered and were the only survivors. Whether their recovery is to be related to the treatment administered is not known.

The available evidence does not allow definite conclusions to be drawn on bacteriological grounds as to

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whether or not contaminated penicillin was used. It seems reasonably certain that penicillin was sterile on issue from the laboratory, but during the period in which these cases developed the dregs in the bottles were not cultured on return from the ward. However, in 2 cases, as recorded above, it is believed on clinical and pathological evidence that the intrathecal injection of contaminated penicillin might have been the source of the meningitis.

SUMMARY AND CONCLUSIONS

A series of 11 cases of meningitis due to *Ps. pyocyanea*, with 9 deaths, is discussed with special reference to the pathogenesis. In 9 cases it is believed that infection of the cerebral wound spread to the subarachnoid space or ventricular system. The other 2 cases are thought to have developed meningitis as a result of the introduction into the lumbar theca of penicillin contaminated with *Ps. pyocyanea*.

Of the first 9 cases, 4 were secondary to brain abscess, and it seems likely that *Ps. pyocyanea* was present before admission in 3. The fourth case showed coliform organisms in cultures taken from the brain at operation and the patient also reopened the wound later, so the origin of the infection is uncertain. Cultures in another case grew *Ps. pyocyanea* from temporal muscle adjoining the subarachnoid space. The source of infection in 4 cases seems to be cross-infection in hospital, and this is attributed in 3 cases to leaving a tube in the wound for the repeated instillation of penicillin.

The risk of *Ps. pyocyanea* meningitis is minimised by complete debridement and primary closure of penetrating wounds, and by avoiding the placing of tubes in wounds for the introduction of penicillin. The intrathecal injection of penicillin should mostly be restricted to the treatment of meningitis; in prophylaxis it should be used with caution. For intrathecal use penicillin should be issued in bottles containing only sufficient solution for a single injection.

This experience supports previous pleas for the observation of all possible precautions to prevent cross-infection in hospital.

Some of the bacteriological and pathological studies were carried out by Major J. P. Wyatt, RCAMC, and Major Stanley Hartroft, RCAMC.

REFERENCES

Cairns, H. (1944) *Brit. J. Surg.* **32**, 199.
McKissock, W., Logue, V., Bartholomew, I. (1944) *Brit. med. J.* ii, 551.
Magner, D. (1944) Personal communication.
Ross, M., Magner, D. (1944) Unpublished material.

INFECTION FROM SPINAL ANALGESIA

A WARNING

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RECENTLY there have been two unfortunate instances of sepsis following spinal analgesia, both of which resulted in death from meningitis. The two patients were given spinal anæsthetics within three days of one another by the same anæsthetist, a young man both skilled and careful. The theatre was off the ward; the anæsthetist, after scrubbing up, wore rubber gloves; and the syringes and needles, which had previously been kept in spirit for at least 24 hours, were rinsed in cold sterile saline before use. In each case the patient's back was prepared in the usual way with spirit and iodine.

A preliminary injection of 'Novocain' was given, the novocain being taken from a rubber-capped bottle, the top of which was removed to allow of ease in filling the syringe. The syringe used was the same 2 c.cm. Record syringe which was employed for the injection of the spinal anæsthetic ('Nupercaine'). Both patients subsequently developed meningitis. The cerebrospinal fluid was found to be turbid and to contain large numbers of polymorphonuclear pus cells. Stained films showed gram-negative bacilli in large quantities. Culture yielded a profuse growth of *Ps. pyocyanea* only. *Ps. pyocyanea* had recently been much in evidence in the hospital, and the question arose as to how the infection had occurred.

Sometime previously *Ps. pyocyanea* had been discovered in a specimen of cerebrospinal fluid sent for pathological investigation from another patient who showed no signs of meningitis. On this occasion the *Ps. pyocyanea* was eventually traced to the "sterile" distilled water, which was kept in a winchester. But where had the infection come from in these two particular cases? It was deemed possible that it was again a matter of the so-called sterile distilled water being used; but the sister had in fact put out cold sterile saline which was sterilised by means of steam which ran round a coil inside the container.

Cultures taken from the tap of the saline container yielded a growth of air-borne cocci but no *Ps. pyocyanea*. A further specimen of the saline itself proved to be sterile, as did the syringes and needles which had been in spirit for some days after the infection was discovered. In addition an ampoule of nupercaine from the same batch was cultured; this also proved to be sterile. The ampoules of nupercaine are kept in 1 in 2000 biniodide solution, the labels being maintained in position by means of cotton thread. The ampoules themselves are held in gauze while the top is being filed off, so that, as Hewer and Garrod [1] have pointed out, contamination is unlikely.

Unfortunately it was not possible to make cultures from the novocain solution, because the remainder of this had been thrown away. It may be that this solution was already contaminated by a syringe which had been rinsed out in water infected with *Ps. pyocyanea*. This, however, is mere conjecture.

Whatever the source of infection, the moral is obvious: well-defined rules for the sterilisation of apparatus used for spinal analgesia must be adhered to.

Sterilisation of apparatus.—All spinal syringes and needles should be boiled for at least five minutes. The syringes should be kept in spirit and be used solely for spinal analgesia, being taken from the spirit and *boiled before and after use*. Since there is some risk of syringes cracking during the process of boiling, it is wiser to use an all-glass syringe if possible. If, however, Record syringes are preferred, these should be taken apart, wrapped in gauze, placed in warm water and brought up to the boil. It is sometimes said that heat blunts the points of the needles, but we have not found this to be so if the needles are fitted with a guard made of rubber tubing, which is a little longer than the needle itself, so that the point is protected.

Ampoules of nupercaine should be kept in biniodide, and when taken out for use should be placed in a sterile kidney bowl on the trolley so that the ampoule may be picked up in a piece of gauze, thus ensuring that the anæsthetist does not actually touch the ampoule itself.

Novocain for local anæsthesia should also be taken from an ampoule opened at the time of use, observing all the precautions already detailed.

The skin should be prepared with spirit followed by iodine. The anæsthetist should always wear gloves, and the technique of injection should be such that he handles the spinal needles as little as possible and on no account touches the point of it. A Sise introducer for puncturing the skin may be used with advantage.

The trolley should be freshly laid out with sterile towels, galley pots, &c. The needles and syringes may be rinsed with sterile distilled water, but the bottle of sterile distilled water should always be opened freshly for the particular occasion, the remaining contents being subsequently discarded. We now use special 100 c.cm. bottles of sterilised distilled water which are easily obtainable.

If all these precautions are duly observed there should be no risk of introducing sepsis into the spinal theca.

SUMMARY

Two fatal cases of *Ps. pyocyanea* meningitis following spinal analgesia are recorded.

Recommendations for the sterilisation of syringes and needles by boiling are given in detail.

It is suggested that the local anæsthetic agent should be taken from an ampoule opened for the occasion, and that sterilised distilled water should be used, this also being taken from a bottle opened at the time, the remaining contents being afterwards discarded.

1. Hewer, C. L., Garrod, L. P. *Brit. med. J.* 1942, i, 306.

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VENOUS THROMBOSIS FOLLOWING PENTOTHAL ANÆSTHESIA

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LATE ANÆSTHETICS REGISTRAR, ROYAL FREE HOSPITAL, LONDON

THE following case illustrates a local effect of pentothal anæsthesia when associated with venous stasis.

A woman, aged 53, a poor anæsthetic and surgical risk, was admitted to the Royal Free Hospital for a left nephrectomy, and it was decided to operate under cyclopropane anæsthesia. 'Omnopon' gr. 1/3 and scopolamine gr. 1/150 was given preoperatively, and on arrival in the theatre she was placed on her right side with a pillow under her head. It was decided to anæsthetise her in that position. After induction with 0·5 gramme of 'Pentothal sodium' in 10 c.cm. of water, slowly given into the right median basilic vein, her hand was placed under her right cheek, thus flexing her elbow to about 20°. Anæsthesia was continued under a fairly light cyclopropane /oxygen mixture and at no time was there any anxiety as to her condition. The operation took about 45 minutes. Next day I was asked to see her. She was propped up in bed and a little cyanosed. She complained that her right forearm felt tight and there was fairly severe œdema from the antecubital fossa downwards. The median cephalic and basilic veins could be palpated and felt thrombosed; the radial pulse was palpable and there were no signs of extravasation of blood. Her general condition deteriorated following right heart-failure and she died the 4th day after operation.

At necropsy the arm was still as œdematous as it had been since the second day after operation. The clinical diagnosis was confirmed by the pathologist, who kindly allowed me to dissect out the veins of the arm. Most of the superficial and deep veins of the forearm had thrombosed. There were no signs of sepsis or extravasation around the site of injection. It was concluded that the œdema was due to some degree of "backflow" of pentothal and stasis resulting from the acute flexion of the forearm associated with a poor venous return.

My thanks are due to Miss K. Lewis, surgeon to the Royal Free Hospital, for permission to record the case.

Reviews of Books

Mental Abnormality and Crime

Edited by L. RADZINOWICZ, LLD CRACOW & ROME, J. W. C. TURNER, LLB CAMB., from the department of criminal science, University of Cambridge. (Macmillan. Pp. 316. 18*s*.)

THIS second volume of the *English Studies in Criminal Science* is an important collection of essays by experts in many fields. Dr. Angus MacNiven considers criminal responsibility in relation to the McNaghten rules. The present application of the law is so liberal and humane, he believes, that the defence of "uncontrollable impulse" is undesirable and unnecessary—a view supported by the experience of prison psychiatrists. Dr. MacNiven considers that anyone criticising the criteria of responsibility laid down in the McNaghten rules is faced with the almost insuperable difficulty of deciding on the precise meaning of the terms used; but Lord Reading, in 1916, explained these terms in simple and direct language which dispelled the fog. The criteria to be applied in arriving at the conclusion that the accused is "unfit to plead" may well find a place in this section in future editions; official figures show that in England and Wales their number is not far short of those found "guilty but insane." It is worth noting that the number found to be insane in the magistrates' courts, and there dealt with according to ordinary standards of certifiable insanity, is more than five times greater than the number dealt with in the higher criminal courts and found unfit to plead, or guilty but insane. Dr. W. Norwood East, in a chapter on physical factors and criminal behaviour, insists that theories of the association of physique and character should be applied in the field of criminology with extreme caution; and recalls that it may be difficult to decide in an individual case whether the physical or mental condition of an offender has been predominant in causing a criminal act. Other important contributions deal with alcoholism, juvenile delinquency, and Service problems.

Advances directed towards the rehabilitation of offenders have been introduced by modern legislation and modern prison administration. A scientific approach to mental abnormality and crime must be our future aim. Many essays in the book bear on this point and will prove valuable to lawyers, doctors, and workers in the social and moral sciences.

Hipertension Arterial Nefrogena

E. BRAUN-MENENDEZ, J. C. FASCIOLO, L. F. LELOIR, J. M. MUÑOZ, A. C. TAQUINI. (Libreria y Editorial 'El Ateneo.' Pp. 475.)

THE Argentine school of medicine have been in the forefront of the mass attack on the problem of hypertension, and in this volume provide a critical survey of our present knowledge. They concentrate on the problem of hypertension of renal origin, though they also consider essential hypertension. Experimental and clinical investigations, and methods of treatment are all reviewed with discrimination, though naturally the rôle of renal ischæmia and renin dominates the work. The bibliography is an example of the thoroughness which characterises the book: it contains over 1100 references and is international in outlook. Clinician and physiologist will find it an essential reference work for many years to come. It deserves an English translation.

Social Service in a General Hospital

DOROTHY MANCHÉE, head almoner of St. Mary's Hospital, London. (Baillière. Pp. 164. 6*s*.)

THIS little manual, compiled primarily for almoner students, contains much concise detail. The fundamentals of medicosocial work, simply explained, lead naturally to a study of the working of an almoner's department in a general hospital. Diagnosis of the patient's need is made at the first interview, and medical notes and consultations with the doctor help the almoner to form a plan for each patient. She must be fully aware of existing services in the community and use them. The word "Watch" on a case-paper means that almoner and patient keep in touch all the time, and much valuable information may be passed on to the doctor in this way.

The almoner is one of a team, complementary with the doctor and nursing staff, and Miss Manchée shows how doctors could make more use of the almoner's department in hospital. She writes with humour and tells good anecdotes. If the detail seems profuse and elementary to the doctor reader it will not seem so to medical or almoner students. Diagrams and tables illustrate the text.

Endocrine Man

L. R. BROSTER, FRCS. (Heinemann. Pp. 144. 12*s*. 6*d*.)

THE title of Mr. Broster's essay suggests a greater breadth of treatment than he has in fact attempted. The emphasis is laid almost exclusively on the adrenogenital syndrome and the book is largely a summary of his own well-known work. To sum up the subject of evolution in a few pages is a task at which anyone might baulk, and though Mr. Broster's brave attempt is readable, its relevance to the main theme, like that of the final chapters on symbiosis and parasitism and the nature of man, is somewhat tenuous. He has some pleasant flights of speculation. The witches in Macbeth may well have been examples of adrenal virilism; but perhaps it is stretching things a little far to suggest that Julius Cæsar had Cushing's syndrome in mind, when he expressed his preference for obesity.

Regional Analgesia

H. W. L. MOLESWORTH, FRCS, senior surgeon, Royal Victoria Hospital, Folkestone. (Lewis. Pp. 90. 8*s*. 6*d*.)

THE quality of this little book could be more uniform. It opens with a really helpful chapter on general principles. It is true that for success with local anæsthesia the patient, surgeon, and anæsthetist should be in the right frame of mind, and that spectators, too, have their part to play. There are good sections on care of needles, overdose of local anæsthetics, and choice of anæsthetic. But it is a pity that, after pointing out that 'Percaine' has been confused with procaine with disastrous results, Mr. Molesworth should refer to 'Percaine' throughout the text, and only thrice use the correct name of 'Nupercaine,' deliberately adopted by the makers to avoid this dangerous confusion.

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THE LANCET

LONDON: SATURDAY, JANUARY 27, 1945

An Academy of Medicine

THE profession is invited to consider two ventures in post-war medical development which have nothing to do with the white-paper on a National Health Service. Both have been mooted under the title of An Academy of Medicine. The first is the gathering together of the buildings of the Royal Colleges of Physicians, Surgeons, and Obstetricians, along with the headquarters of many of the larger specialties; for which purpose the surgeons propose their site in Lincoln's Inn Fields.[1] On this plan the academy would presumably be formed by the voluntary association of its constituent bodies, each retaining its identity and independence, and all sharing a common meeting-house. The second proposal is the much more ambitious one sketched by Sir STEWART DUKE-ELDER in our columns two years ago.[2] His academy would be "a corporation with a statutory basis, of compact size, authoritatively selected, and wholly divorced from politics. It should be supported by and work intimately with the State, be affiliated to the Privy Council, and thus responsible through a minister to Parliament." He places under it half a dozen councils: a Council of Civil and Social Medicine; an Imperial Medical Council; an International Medical Council; the Medical Research Council; a group of Professional Councils (including the Royal Colleges); and a Council of Medical Education, whose postgraduate hospital in London would stand in the same relation to the teaching hospitals as these do to their associated sector hospitals. The functions he allots to these councils are some advisory and some executive. Sir STEWART has now commended[3] association of the three Royal Colleges in Lincoln's Inn Fields as a first step towards the creation of the statutory academy he has in mind.

The assumption that the first proposal is an instalment of the second may be too readily accepted. An examination of the purpose in view, and of the likelihood that the suggested organisation will serve that purpose, should come first. The object of Sir STEWART'S academy is threefold: to advise the State, with a single authoritative voice, on how it should direct and administer its medical services; to establish British medicine, in place of German, as a leading cultural and political influence in post-war Europe; and to be the channel of medicine's contribution to the invigoration of our own national life. Are these functions best served by bodies under government control or by bodies independent of government? The advice given to government should be purely professional and scientific, leaving political considerations out of account; but Sir STEWART'S academy, subvented by large sums of government money, and designed as a pyramidal structure with a minister at its apex, might be subject to political and bureaucratic influence. Situations might even arise where the only way to elicit a "single authoritative voice" from medicine would be to exert pressure on it from above. The leadership of European medicine is a worthy aim, but it should be sought for its own sake, not as support to British political influence abroad; and it should rest on the excellence of British medicine, not on the strength of government-sponsored salesmanship. The zeal of medicine in the national peace effort might be sapped if all its professional bodies were over-organised under high direction. To these doubts it may be objected that Sir STEWART'S academy is to be affiliated with the Privy Council, as distinct from a ministerial department, and is to be "wholly divorced from politics"; and the present Medical Research Council may be quoted as an example of a professional body enjoying both freedom and government finance. But the MRC's annual quarter of a million is a small sum. The academy would need many times that, and as an organisation and its cost grow large, government control is liable to become more close and detailed. The international rôle of the academy is a particularly delicate one. Sir STEWART almost admits that its chief aim may become political, when he urges that British influence should replace that of Berlin, which "was exploited for political ends." Such exploitation of British medicine might prove tempting to a government finding itself in close control of most of the organisation; and while at the moment the profession may find itself at one with the government and the country on its foreign policy this may not always be so.

With socialisation, and its almost inevitable instrument, bureaucracy, steadily and quietly transforming the structure of our society, it is well to distinguish those functions of society well served by socialism from those that are hampered by its cumbrous and uniform machinery. Among the former are mechanical offices, like delivering letters or making munitions, and in general all large tasks which can be simply and precisely formulated in advance. Among the latter are most of the activities of man which we call cultural or creative. For these the utmost freedom of individuals or of groups is a first essential—complete freedom of expression and reasonable liberty of action. They cannot be administratively integrated. The task of medicine is neither purely mechanical and computable, nor purely creative. It is something of each. So while it may be proper that its routine work should be tied up in an organised health service—albeit with pink elastic rather than with red tape—it is essential that its philosophy and its search for truth should be free, and that the bodies that give expression to these should be independent. The principle is easily stated; but putting it into practice requires money; and, with the levelling of incomes that socialism involves, independent financial support for the "higher" activities of the human spirit shrinks: already the State supports art galleries, though not yet opera-houses. It is a problem of the socialised State that it must find ways of paying for these things, without exercising close control; for close control is the expression of the average mind, and these are the activities of the gifted. As things are, it had better pay smaller sums to chosen bodies and trust them with the spending, rather than organise a ministry of fine arts or a government Academy of Medicine.

1. *Lancet*, 1944, ii, 605. 2. *Ibid*, 1942, ii, 686.
3. *Times*, Jan. 10, p. 5.

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For most of the objects Sir STEWART DUKE-ELDER has in view, the Royal Colleges, by virtues of their tradition and their independence, are bodies well suited to the task. In research they can play a part complementary to that of the universities and the hospitals. In some degree they are perhaps too narrowly centred on London; a reorganisation of the equivalent bodies in Scotland into one or two Scottish colleges would do much to compensate for that. In presenting British medicine to the world, they are handicapped by their isolation and the inadequacy of their buildings. Undoubtedly their own life and their wider contribution would be enriched by rehousing them in propinquity, and it will be a disappointment and a missed opportunity if the Lincoln's Inn Fields plan, or a better, does not materalise. If Government support is necessary it might be given as payment for services rendered in connexion with higher qualifications and their examinations. And if the group of colleges take for themselves the name Academy, they should do so as a free association of independent bodies, coöperating for their own and their common ends, after a fashion already familiar in the British Commonwealth of Nations.

Keep Moving Please

WE are all familiar with the patient after an abdominal operation who lies painfully still, fearing to move limb or muscle. And with his joy when he is told: "You can move about, run if you like—there isn't the slightest risk of your bursting." We are largely to blame for his over-cautious attitude, for we do not always impress on the nursing staff the importance of encouraging early movements; from his first awakening from the anæsthetic the patient hears the nurse calling on him to keep still. It is a pity that in many hospitals the surgical nursing lectures and the orders for postoperative treatment are the tasks of junior house-officers, and the surgeon is rarely invited to talk to the nurses. ROWLANDS of Guy's used to tell his patients, with assumed dignity, "I confer on you the freedom of the bed," and it went down well. Early movement is one of our most powerful counter-measures against pulmonary embolism or massive collapse of the lung. Its local value we also know; the muscle contraction calls for and brings more blood, while the squeezing of lymphatics scavenges debris and prevents the stagnation and organisation of pools of lymph glue.

We know that the moving face muscles heal well; so does the tongue, and so does the ever-moving chest wall. We have not so much faith in the abdominal wall. Yet many surgeons get their patients after simple abdominal operations out of bed by the 4th day, and one at least insists that his abdomino-perineals meet him in the corridor by the 7th day. Particularly in America[1] there is a trend to get patients up even earlier—walking within the first 24 hours after operation—the contention being that the 3rd day is too late if lung complications or venous thrombosis are to be avoided. NELSON[2] has reported on 426 abdominal operations treated by early ambulation, and has been impressed by their more rapid and smooth convalescence. Within a few hours of the operation he asks them to walk to the bathroom (no-one is unduly urged to do this); they then sit up in a chair for a time before returning to bed. The abdominal wound hurts slightly at first, but with further movement becomes less painful. Most surgeons will agree with this observation, and undoubtedly the "moving" patient is rarely troubled by painful stitches. NELSON also points out that, despite their bawlings and struggles, wound disruption is almost unknown after operations on infants; and in animals, even with their vigorous movements, experimental wounds heal firmly. But catgut was not used at any of NELSON'S operations; indeed he recommends that only if cotton or nylon has been used should early ambulation be allowed. LOCALIO, CASALE, and HINTON[3] have shown experimentally that the tensile strength of a wound sutured with catgut is at its weakest on the 3rd or 4th day, and MASON[4] maintains that any motion during this lag period will stretch the forming scar. With cotton, nylon, or wire the minimal strength of the wound is at all times far above that with catgut. In Britain catgut is still on the whole favoured, although there is a growing tendency to use non-absorbable suture material. Such very early rising may for this reason—and others too—not be advisable after abdominal section, at any rate in this country. Moreover, NELSON'S figures indicate that 317 out of his 426 abdominal operations were appendicectomies; although the 79 hernia wounds healed well, the follow-up results are not described, and these are the real test. The appendicectomy wound is usually valvular and does not necessitate a long convalescence. South Africans will recall an international rugger match where the New Zealand full back played 3 weeks after an emergency appendicectomy (and he had done some training first). But to get a soldier fit for duty takes longer. DIVELY[5] found that after appendicectomy an average of 61 days' rehabilitation was needed for the US soldier to be able to march 17 miles a day with full kit.

Our attitude towards head injuries too has changed in recent years. We no longer insist that the patient with concussion or a fractured skull must lie still in a room with drawn blinds and darkened lamps, while all around, with tiptoe and whispering, gloomy faces tell him to keep quite still. That is a sure way to convince him that his brain has been damaged, that he will be abnormal and unable to compete fully in his future life. Emphasis is now laid on the near-certainty that there will be no permanent damage—he is got out of bed early, rapidly rehabilitated, and by trial brought back to normal life. If he gets headaches or dizziness he may be put back temporarily, but only for a day or so. How satisfactory this may be is shown by CADE'S[6] extensive experience of head injuries in the Royal Air Force. He has enunciated a new all-or-none law: "If a case of head injury escapes death, the injury is such that return to full flying duties can confidently be anticipated."

There are two important contra-indications to very early movement after operation—when infection

1. Neuberger, B. *Surgery*, 1943, **14**, 142.
2. Nelson, H. *Arch. Surg.* 1944, **49**, 1.
3. Localio, S. A., Casale, W., Hinton, J. W. *Surg. Gynec. Obstet.* 1943, **77**, 376. *Ibid* (*Int. Abstr. Surg.*), p. 369.
4. Mason, M. L. *Ibid*, 1939, **69**, 303.
5. British Orthopædic Association meeting, London, Dec. 15, 1944.
6. Cade, S. *Brit. J. Surg.* 1944, **32**, 12.

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is present or likely, and when the tissues are ischæmic (and in that may be included tissues under tension). To move infected tissue is to squeeze and spread the infection in the lymphatics; that TRUETA and BARNES[7] have proved. To move ischæmic tissues is to increase the local metabolism and add to the calls on the trickling oxygen stream. But there is a definite advantage in moving such ischæmic tissues once the ischæmic crisis has been tided over; movement at this stage will call on and force more rapid building up of the collateral vessels.

Apart from such definite contra-indications, we must ask ourselves whether this drive for early active movements may encourage irresponsible over-enthusiasm. Whether it may foster ankylophobia and bring us back again to the days of LUCAS-CHAMPIONNIÈRE. Undoubtedly there is such risk. We need to ask ourselves also whether we may be jettisoning the fundamental principle of rest for the healing tissues. But, as JEAN PIERRE DAVID wrote nearly 170 years ago, "absolute rest is an imaginary thing"; no splint immobilises absolutely. THOMAS refused to use plaster because he thought it might constrict the circulation. We now know that the well-applied plaster does not do this, and that beneath that plaster the muscles still contract and glide within their sheaths. WATSON-JONES has done much to urge the importance of muscle contraction for the immobilised bone or joint injury. He has stressed that muscle contraction within a plaster cast accelerates the circulation of blood and of lymph; thus stasis is prevented, and stiffness of the immobilised joints is avoided. To move the fingers is to ensure that the immobilised wrist will not become stiff; to activate the muscles of the lower limb will prevent stiffness of the knee or ankle. It is important however to differentiate between muscle and joint movement. It is generally agreed that to move the joints contiguous to a fracture or wound is to risk tearing the frail healing tissues. It is no argument that healing may still take place, for we know that "nature will work out its rights some way or other through the worst sophistication." The healthy immobilised joint, despite long immobilisation, will not become irreparably stiff if muscle contraction has been attended to. "Action is life" was CHAMPIONNIÈRE'S slogan, but it holds true for the muscles only.

Passive movements are to be condemned. They will not stimulate the muscles; they may tear and lead to further scarring, myositis ossificans, and secondary nerve lesions. Only when there is a nerve lesion or an ischæmic palsy should passive movement be allowed. Tissues that have been disrupted, especially in gunshot injuries, are apt to become tethered and adherent to surrounding structures, but the temptation to free them by passive stretching must be resisted. The patient needs to have explained to him that "if there is a little movement, nature will soon make it a little more." Minimal movements soon become major under the stimulus of necessity. But freedom of movement, like other freedoms, has to be worked and fought for—and it all depends on the patient. We need to impress on him that "skill to do comes with the doing."

7. Barnes, J. M., Trueta, J. *Lancet*, 1941, i, 623.

Trends in Treatment of Burns

AFTER five years of war in which burns have been very common, there is still no general agreement about their treatment. The surgeon with experience of these injuries before the war may well be surprised at the sudden and drastic condemnation of the coagulation methods formerly approved. Though locally it may kill epithelial cells, and if absorbed it damages the liver, tannic acid has not been abandoned primarily for these reasons, but because better means of treatment have been evolved. The replacement of coagulation therapy has been hastened by its unsuitability to conditions of active service. To some extent changes in method have been the result of experimental work in the laboratory which has thrown more light on the essential lesion of a burn. This aspect is ably reviewed by GLENN.[1]

That a true toxæmia exists in the early stages of a severe burn is still fairly widely accepted. Often there is an otherwise unexplained pyrexia at a time before infection has become established, and interference with the function of the liver has been detected in cases where tannic acid has not been used. The "toxin," presumably a product of the damaged tissues, remains unidentified. Recently a new globulin fraction has been found in the lymph from a burnt area; and this lymph also contains a substance that will stimulate the respiration of liver slices in vitro.[2] If either of these is a toxin then it will obviously be an advantage to restrict the flow of lymph from a burn as much as possible. Production of lymph is always excessive because of the greatly increased permeability of the blood capillaries. Exposure to temperatures of 55° C or above results in an irreversible change in the walls of the capillaries, rendering them permeable to blood-plasma.[3] Fluid is lost into the tissues round the burn, and part of it may escape from the raw surface. It was the loss of this latter fraction that could be prevented by tanning, but whether retention of this fluid that had already left the circulation was of much value is questionable. The fact that capillary permeability remains increased for a number of days must be borne in mind. Fluid and protein loss may readily be restored by plasma transfusions, but little is gained if the extra fluid is allowed to escape immediately into the tissues. Excessive distension of the tissues will take place, and this, as GLENN points out, may interfere with the nutrition of the surviving surface tissues and also induce pain.

To control this capillary exudation the application of pressure dressings has become increasingly popular in America. The use of these dressings has recently been redescribed by their originator, SUMNER KOCH.[4] A simple bland dressing is applied to the burn and this is firmly bandaged over a thick layer of mechanic's cotton-waste. The dressings are changed at intervals of ten days or more. Unfortunately it is difficult to control the pressure when applying a dressing of this type, especially if it is being done in a hurry. Too little pressure is useless, while too much may be disastrous. An alternative method of controlling exudation is enclosure in plaster-of-paris casts.

1. Glenn, W. W. L. *Ann. Surg.* 1944, **119**, 801.
2. Muus, J. Hardenbergh, E. *J. Biol. Chem.* 1944, **152**, 1.
3. McCarrell, J. *Amer. J. Physiol.* 1940, **128**, 349.
4. Koch, S. *J. Amer. med. Ass.*, 1944, **125**, 612.

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When these are applied early, swelling continues inside them until the pressure exerted by the tissues on the wall of the cast equals that of the fluid inside the capillaries. When this stage is reached no more fluid escapes from the vessels. Experimentally it has been shown that under these conditions of equilibrium inside a cast the circulation is completely satisfactory.[5] Supporting this is the successful use of plaster casts in the treatment of burns. As GLENN has insisted, *no pressure* must be exerted when the cast is being put on: the natural tendency to apply any bandage tightly may well explain a number of disasters due to ischæmia inside plaster casts in other types of injury. Apart from its value in reducing the amount of fluid lost from the circulation, the prevention of œdema reduces the chances of fibrosis and subsequent stiffness round the lesion. LEVENSON and LUND [6] agree with earlier users of plaster casts that immobilisation per se is not a cause of stiffness.

The dangers of infection remain serious despite advances in chemotherapy. The value of the initial cleansing of a fresh burn remains in doubt, but infection comes all too easily as a sequel to changes of dressings in hospitals. The technique of dressing wounds has been much improved, but is far from foolproof. The Royal Air Force [7] still advocate a method of treatment involving daily change of dressings. Though this may not be risky when carried out in special burn centres, it remains true that the less often a dressing is changed the more time there is to devote proper care and attention to the operation, and the fewer the opportunities for infection. GURD and GERRIE,[8] in a useful review of skin-grafting, in these cases, assume the changes of dressing to be relatively infrequent, and say that on each occasion preparation should be made for carrying out a graft if conditions are found suitable. By this means raw areas are covered at the earliest opportunity, and the time taken for a deep burn to heal becomes a matter of weeks rather than months.

The general condition of a burnt patient must be watched with particular care. Apart from conditions demanding blood-transfusion there is a pronounced katabolism of protein, starting soon after the injury, and the amount of nitrogen lost in the urine may be the equivalent of as much as four times the normal daily protein intake of the patient.[9] Further protein may be lost from the surface of the burns in the exudate: the nitrogen equivalent of this may be as high as a quarter of the total being lost in the urine.[10] To replace all this protein may be impossible in a sick man, but a diet with high protein content is obviously called for until healing is well advanced.

5. Glenn, W. W. L., Gilbert, H. H., Drinker, C. K. *J. clin. Invest.* 1943, **22**, 609.
6. Levenson, S. M., Lund, C. C. *J. Amer. med. Ass.* 1943, **123**, 272.
7. Air Ministry pamphlet 168, First Aid and Early Treatment of Burns, 1944.
8. Gurd, F. B., Gerrie, J. W. *J. Amer. med. Ass.* 1944, **125**, 616.
9. Taylor, F. H. L. et al. *Ann. Surg.* 1943, **118**, 215.
10. Hirschfield, J. W., Williams, H. H., Abbott, W. E., Heller, C. G., Pilling, M. A. *Surgery*, 1944, **15**, 766.

On Thursday, Feb. 1, at 3 PM, Mr. W. S. Morrison, Minister of Town and Country Planning, will open an exhibition of plans and models of the scheme for the reconstruction of Bath which has been prepared for the Bath and district joint planning committee by Sir Patrick Abercrombie and the city engineer and planning officer.

Annotations

GOVERNMENT AND GOODENOUGH REPORT

ON another page we print a statement by the Minister of Health on the Goodenough Committee's programme for reform and development of medical education. The Government have recognised the principle that larger grants will be needed for medical education and research. The additional funds will be distributed by the University Grants Committee, through the universities, to the medical schools, postgraduate institutes, and hospitals in which teaching and research are carried on, and for a time these additional grants will be separated from the block grants received by the universities for their work as a whole. The decision of the Government that future payments of grants to medical schools will be contingent on their admitting a reasonable proportion of students of both sexes should lessen the difficulty of securing places in hospital now experienced by women students, especially in London. The Government realise that it may take time for some of the schools which at present accept only men to provide accommodation suitable for women, and suggest that the University Grants Committee, in consultation with university authorities, should decide whether reasonable action is being taken by the schools to meet this requirement. Increase of grants will also depend on revision of the curriculum, and Mr. Willink expressed the satisfaction of the Government on learning that the General Medical Council is already moving towards reform. The amounts of grants to be made, whether for capital or recurrent expenditure, will be decided according to the recommendations of the University Grants Committee, and the finances of the country at the time.

PERLÈCHE

FIRST described in 1885, the fissuring inflammation of the oral commissures called perlèche has come again into prominence in recent years as a possible indication of nutritional deficiency. But Finnerud [1] now throws doubt on any specific significance of the lesion and suggests that it is merely "a cutaneous symptom occurring in the form of an intertrigo of the labial commissures analogous to intertrigo elsewhere and of manifold ætiology." Lemaistre, who originally described perlèche and derived the word from the French *pourlècher*, to lick (one's lips), favoured an infective cause, and subsequent writers have implicated many organisms. Finnerud, who himself favoured the possibility of a monilia infection some years ago, is now more inclined to conclude that systemic and local factors prepare the soil before any infective element comes into the story. Among local factors must be considered those of dental origin, such as malocclusion from ill-fitting dentures, and possibly, though Finnerud does not include this, the leaving out of dentures at night, allowing so much overlap of the lips as to lead to a constant maceration at the corners. Perlèche due to vitamin deficiency is well established on an experimental basis and in riboflavine deficiency fissures of the corners of the mouth undoubtedly do occur, often associated with cheilosis and changes in the tongue. Micro-organisms have been obtained from such lesions but quickly disappear as the lesions heal under treatment with riboflavine, brewer's yeast, or liver extract. But Finnerud's list does not end with infection, malocclusion, and vitamin deficiency. He includes an idiopathic perlèche for which no adequate cause can be found, and under the heading "pseudoperlèche" he lists lesions of the corners of the mouth in cases of contact dermatitis, neurodermatitis, seborrhœic dermatitis, atopic dermatitis, severe "chapping," and herpes, to which he adds the rhagades of congenital syphilis. Faced with such a list the nutritional expert must obviously exercise caution

1. Finnerud, C. W. *J. Amer. Med. Ass.* 1944, **126**, 737.

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before he diagnoses riboflavine deficiency on the mouth-angle lesions alone. Probably Finnerud is right to suggest that the old name is best retained for a local condition which may arise in so many ways.

CUTTING THE APRON STRINGS

HUMAN young in a civilised community are animals of slow growth. Years are needed for the transition from the helpless creature in utero to the active adolescent. When physical union with the mother is severed the infant usually celebrates audibly the first independent use of his functions; but he takes many months and years to complete the physical and psychological weaning from his mother, only gradually asserting his increasing power to live by his own efforts and by his own wits. Ultimately the time is reached when he cuts the apron-strings, as once the midwife cut the navel-string for him. We know the right moment to cut the navel-string; and thereafter all child nurture and education is designed to help him to loosen the apron-strings. But do we know just when he should begin and just how fast he should go? We seem to be getting a little impatient with his slowness. Education Acts of the past have put 5 years as the age at which the child should take his first official step towards becoming a member of a social community in his own right. The Education Act of 1944 proposes that he should be widely encouraged to take that step at 2 years old. The popularity of war-time day nurseries (quite apart from the value they are believed to have to the war effort) suggests that many people think that he is ready even earlier for some degree of life on his own in a community.

What do we gain, or rather, what does the child gain, by this growing attempt to wean him from his mother and his home while still an infant? Greater confidence in himself perhaps, and a quicker development of bodily and mental powers? It is said that the stimulus of the company of others and a wider range of things to see and hear and use quicken the response; and the nursery-school teacher, trained to watch and learn from children, does not doubt that it is true. But children do not go to nursery schools until they are 2 or 3 years old. During the war we have drawn numbers of children under 2 into the community life of day nurseries, and many doctors and nurses have had a chance to learn how they respond. A letter in our correspondence columns notes that the Medical Women's Federation is attempting to gather some of this experience, as it relates to the children's physical health. Children in day nurseries catch infectious diseases, notifiable and other (indeed the non-notifiable respiratory infections seem the worst bugbear); but children not in nurseries catch infections too and we need to compare the incidence inside and outside nurseries. Information on this point will be really useful, and we commend the project to medical officers of health, whose coöperation is sought.

But physical health is only half the story. How does the child under 2 respond to the mental stimulus of community life? Is it in fact a stimulus to which he *can* respond—to which he is ready to respond? There seems little doubt about the response of the child of nursery-school age, but with the under-2's, and perhaps even the under-3's, we are on less sure ground. Often it seems that the child of this age does not want as yet to join with his fellows. Undeveloped, and still uncertain of his own individuality, he demands the security of adult attention to a degree impossible to provide under nursery conditions. It is not just physical attention that he wants, but that constant "awareness" of him which is the basis of his mother's relationship with him. Lack of it for some hours every day may put too great a strain on some children: but knowledge on this point is scanty and research difficult. Moreover, the personality of the child is also affected by the varying personalities of the nursery staff and the degree to which each, by virtue of her character or training, can meet his needs. The child's well-being, however, is linked with the mother's, and it may be said that constant awareness of the child is in itself a strain. This is an argument for part-time day nurseries, where young children may be placed for a day, or perhaps even a few hours, weekly, so that the mother may be relieved for a while of her responsibilities and return to them refreshed. A woman who has some opportunity to live her own life, not solely as a mother but as an individual, may make a better mother. Experiments with part-time nurseries should enlighten us.

Ps. PYOCYANEA MENINGITIS

MOST bacteriologists are familiar with the specimen of cerebrospinal fluid which, particularly if there has been delay in transit from hospital to laboratory, looks a little opalescent but is found to contain nothing abnormal except a pleomorphic gram-negative bacillus which is blithely reported as a contaminant. The frequency of such contaminations was illustrated by Smith and Smith[1] in their isolation of "coliform" bacilli, white staphylococci, diphtheroids, and non-hæmolytic streptococci in 40% of 223 specimens of cerebrospinal fluid. About a third of these contaminants were judged to come from the water used to rinse and immerse the sterile syringes and needles before spinal puncture. Such contaminating bacteria, apart from being an annoyance and sometimes a snare for the bacteriologist, probably do little or no harm where lumbar puncture is performed for the withdrawal of cerebrospinal fluid. It is altogether different if fluid is being injected intrathecally, as is done on a considerable scale with anæsthetics and lately with penicillin. Thus Barrie[2] reported 11 cases of low-grade meningitis with one death among 96 consecutive patients operated on under spinal anæsthesia. In that instance a defective filter used for the preparation of sterile water was probably to blame. Now in this issue Frankis Evans reports 2 fatal cases of *Ps. pyocyanea* meningitis following spinal anæsthesia. The source of the organism was not finally traced, but the needle used for lumbar puncture was stored in spirit, a poor disinfectant, and rinsed with "sterile" saline before use; and rinsing with so-called sterile saline or water is a likely mode of introducing bacterial contaminants. The practice of storing sterile saline or water in large winchester bottles is still too common in hospitals, and no matter how often these bottles are used the label "sterile" or even "distilled" is accepted by the nursing staff as sufficient security, although it is well known that sterile distilled water is easily contaminated.

On another page Botterell and Magner report 11 cases of *Ps. pyocyanea* meningitis—all but 2 of them fatal—from a Canadian neurosurgical unit. The infection in 2 cases was apparently attributable to the intrathecal injection of prophylactic penicillin. Although great care was taken in the preparation of penicillin solutions in the laboratory, and frequent cultures of dispensed samples were sterile, the dregs of two bottles used in the wards contained *Ps. pyocyanea*. In the remaining 9 cases infection was presumed to have spread from the head wound to the subarachroid space with which it was in direct or close contact. Infection of the wound with *Ps. pyocyanea* was probably present in 3 cases before admission, and Botterell and Magner deprecate incomplete operative interference, unless it is unavoidable, before the patient is admitted to a special unit. Cerebral tissue, if debridement is complete, is relatively resistant to infection with gram-negative organisms, but "gram-negative pus" in brain wounds, even when there is free drainage, may be followed by fatal meningitis, and therefore every precaution must be taken to prevent its occurrence. In this Canadian unit the surgical no-touch

1. Smith, W., Smith, M. M. *Lancet*, 1941, ii, 783.
2. Barrie, H. J. *Ibid*, 1941, i, 242.

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technique, which in McKissock's experience has proved so successful in preventing infection of head-wounds, was adopted, but its faithful practice could not always be guaranteed in the face of overcrowded wards and overworked nurses, and Botterell and Magner attribute at least 4 of their pyocyanea infections to ward cross-infection. The risk of such a happening was greatly reduced when they gave up the local instillation of penicillin by rubber tube in favour of primary closure of the wound by suture, with penicillin systemically.

These tragic hospital infections are not isolated occurrences, and their courageous publication should be warning enough. The control of hospital infection concerns every member of the staff, and not least sister-tutors, to whom the instruction of nurses is nowadays largely left and whose teaching is sometimes a little out of date. The nature, sources, and mode of spread of hospital infection, admirably set out in MRC memoranda Nos. 6 and 11, need to be taught early in the nurse's training. It is a job that should primarily belong to the hospital bacteriologist.

HÆMOPTYSIS IN MITRAL STENOSIS

PROFUSE hæmoptysis is sometimes met with in mitral stenosis even when neither pulmonary infarction nor congestive heart-failure is present. Many explanations have been advanced for these cases—that the pulmonary congestion and hypertension accompanying mitral stenosis cause rupture of the pulmonary blood-vessels; that associated pulmonary arteriosclerosis weakens the pulmonary vessels; that the bleeding comes from sudden dilatation of the pulmonary capillaries with diapedesis into the alveoli. None of these suggestions is very convincing. Ferguson and his collaborators[1] now describe a method of injecting the bronchial veins, using a modification of the white-lead solution recommended by Schlesinger[2] for injecting the coronary vessels, whereby they claim to have demonstrated a direct venous connexion between the bronchial and pulmonary veins. They suggest that in mitral stenosis the veins in the submucosa of the larger bronchi dilate as a result of the collateral flow through them, and that rupture of these dilated veins leads to hæmoptysis.

Necropsy specimens from control cases without clinical or pathological evidence of mitral stenosis, from 6 cases of non-rheumatic heart-failure, and from 11 cases of mitral stenosis were investigated. The injection mass, introduced into the pulmonary veins at a pressure of 80 mm. Hg, was never seen in the pulmonary capillaries, nor did it appear in the bronchial or pulmonary arteries, but in all the cases, including the controls, it passed freely from the pulmonary to the bronchial veins. Of the cases of non-rheumatic heart-failure, 3 showed slight dilatation of veins in the larger bronchi. Pulmonary arteriosclerosis did not affect the flow through the bronchial veins, nor was it affected by age or hypertension without heart-failure. Six of the 11 cases of mitral stenosis showed definitely enlarged bronchial veins, and in 4 of these the venous dilatation was pronounced. Four of the 11 cases had a history of hæmoptysis, and 3 of these showed pronounced dilatation, the fourth being unsuitable for the demonstration of bronchial veins because of the presence of hæmorrhagic bronchitis. Hæmoptysis was associated with pulmonary infarction in only 1 case—one of those in which dilated bronchial veins were demonstrated.

Ferguson and his colleagues suggest that in mitral stenosis the flow to the left auricle through the pulmonary veins is hindered. As a result of the rise of pressure in these veins the venous anastomosis is reversed and blood passes from the pulmonary veins to the bronchial veins and thence to the right side of the heart. To cope with this extra strain the submucosal bronchial veins dilate and become varicose. Hæmoptysis is then due to rupture or ulceration of these veins, often precipitated by sudden alterations in pressure induced by a severe coughing bout, or a sudden rise in left auricular pressure such as may occur at the onset of auricular fibrillation. This may not be the whole story, but it fits in fairly well with current conceptions.

1. Ferguson, F. C., Kobilak, R. E., Deitrick, J. E. *Amer. Heart J.* 1944, **28**, 445. 2. Schlesinger, M. J. *Ibid*, 1938, **15**, 528.

PREVENTION OF BLACKOUT

THE impairment of vision during active manœuvre in flight known as "blackout" was first observed clinically in this country when pilots of the Royal Air Force were practising for the Schneider Cup races in 1927. Blurring of vision and blindness were experienced in steep turns. This blackout is the result of centrifugal force applied to the long axis of the body. The increased weight of the blood prevents the heart from maintaining the hydrostatic column between heart and head, and encourages pooling in the lower limbs. The consequent fall of blood-pressure produces retinal ischæmia and so the blackout. Continued application of centrifugal force leads to unconsciousness. Blackout, however, precedes loss of consciousness because the intraocular pressure causes the retinal vessels to collapse while blood still flows through the brain.

Since it is impossible to alter the increased weight of the blood, measures to overcome blackout aim at decreasing the height of the hydrostatic column between heart and head, and at preventing blood from draining into the legs. In theory these objects could be obtained by assuming the prone position, but this is not normally practicable in flight. However, blackout threshold may be increased by crouching forward and raising the legs as the centrifugal force is applied. Cockpit design can do much to make this easy, and during the Battle of Britain pilots of the RAF obtained much benefit from crouching, tensing the abdominal muscles, and raising their feet on specially designed rudder pedals. Suits also have been developed consisting of trousers of inextensible material which reach up to the level of the heart. Within these trousers are a series of carefully placed bladders. In one type the bladders are filled with water, and this exerts an equal and opposite pressure on the vessels in the lower limbs when centrifugal force is applied. If an air suit is worn air is automatically pumped into the bladders when the centrifugal force has reached a certain level. Such suits must be sufficiently comfortable to be tolerated both in the air and on the ground when living in operational conditions. Work on many phases of this problem has been carried out by the Royal Air Force and related to each type of fighter aircraft as it is produced.

PRESERVATIVES IN FOOD

A CIRCULAR from the Ministry of Food relaxes some of the prohibitions of the Public Health (Preservatives &c. in Food) Regulations 1925. Its most important effect is to allow borax, a preservative which was totally prohibited, to be contained in margarine and bacon, two foods in which no preservative of any kind was allowed. Presumably this change in policy is necessitated by war-time difficulties in supply. There is of course no doubt that borax is a convenient means of keeping foods sweet and rendering marketable foods that have been damaged by decomposition. But its prohibition was based on strong objections to its use, and we trust that it will again be proscribed as soon as the food situation permits.

Before the regulations were relaxed, sulphur dioxide and benzoic acid were the only preservatives allowed in any food, and these could be added only in specified amounts to certain foods. Sulphur dioxide may now be used in meat and dried vegetables, and the permissible amount in jam has been raised from 40 to 100 parts per million. To this no serious exception can be taken. Our aim is to abolish preservatives of every description so as to ensure that foods are sold fresh; but where some preservative must be used, the one to which there is least objection is sulphur dioxide.

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Special Articles

HOSPITAL FOOD

III.—WHAT SHOULD BE DONE?

"Doctors should thus their patients' food revise—
What is it? When the meal? and what its size?
How often? When? lest by some sad mistake
Ill sorted things should meet and trouble make."

Regimen Sanitatis written in AD 1100 and quoted in Hutchison's *Food and the Principles of Dietetics.*

NEW interests are prone to oust old ones. When the doctor's weapons were few he used all of them to the full, and diet was one of his most serious cares. Nowadays, with drugs multiplying like mice, and new methods of treatment claiming his attention almost daily, he is apt to forget the older lore in pursuit of the new.

Surgeons are specially liable to feel that food is not their province, for in peace-time, unless they specialise in orthopædics, they commonly deal with short-term cases. There is possibly some truth in the view that just before an operation a patient must not, and just after it he cannot, eat anything, and that by the time he is getting hungry again he is ready to go home. In war-time, however, most surgeons have long-term cases to treat, and need to remember that a man who must face a series of operations should be maintained in the best general health possible by an ample, nutritious, and appetising diet. If that sort of diet is not appearing on the patient's plate it is the job of the surgeon himself to see that it gets there.

Physicians, whose patients are often in hospital for relatively long periods, should have an even more serious concern for the hospital food. The words "full diet" or "light diet" on the bed-card will not work a conjuring trick by which the very meals the doctor had in mind arrive on a tray. Sometimes, if he is a young house-physician, he has no particular meals in mind. He knows that signing up the diet on the bed-card is part of the routine and he gives no thought to its implications. Senior physicians should pay surprise visits to the wards at dinner-time, if necessary braving the wrath of sisters, to see what exactly their patients are eating. But this should not mean an interruption of the meal, with sister dancing attendance and the food getting cold: they should go to observe the routine, not to disrupt it. They should also induce their house-physicians to forgo their dinner once a week and take a patient's meal. If this does not produce some accurate and informed criticism, house-physicians are not what they were.

WHO SHOULD BE RESPONSIBLE?

In our previous articles we have noted the chief causes of bad hospital feeding. These may be summarised in order of importance as:

Lack of due conscience among the medical staff.
Divided responsibility for feeding.
Misplaced thrift.

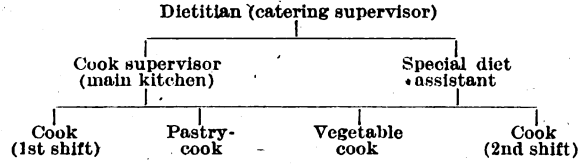
The *Memorandum on Hospital Diet*, published by King Edward's Hospital Fund for London in 1943, recommended that catering—including all processes relating to planning, buying, preparing, and serving the diet—should be regarded as a main department of a hospital; and that the officer in charge of the department should be a qualified dietitian with adequate experience in large-scale catering, or else that he should act in full consultation with a dietitian. To ensure effective working of the catering department, it was suggested, a catering or food service committee should be set up in each hospital. This committee should be fully representative of the medical, administrative, and executive staff, and should coördinate their various interests and responsibilities.

Evidently some hospitals have followed this recommendation, for advertisements for dietitian-caterers appear at intervals. Abroad, the appointment of dietitians to take charge of catering is no new venture; it is the rule in the United States and in some of the Dominions and Colonies. But it is an act of piety rather than sense for a hospital committee to appoint a dietitian and then sit back with folded hands feeling that all is well. In the first place, there are not yet enough dietitians to go round. Secondly, unless she is backed by a strong committee and given definite powers, even the best dietitian will be helpless before the tangle of custom, prerogative, and prejudice which make up the briar-patch of hospital feeding. Moreover, dietitians vary as much as other people. Some have natural authority, some must acquire it; some have the knack of getting on with people, others set them by the ears. And some, though fully trained, are young and inexperienced and must learn to apply their knowledge. Courses in dietetics are still young, and to some extent experimental and incomplete. Thus, many newly qualified dietitians have little practical experience of buying, checking, and costing—all important parts of their work. The Association of Dietitians is anxious to see this side of training improved, and recommends newly qualified members to seek postgraduate experience in catering.

In at least one large London hospital the feeding of patients and staff is managed by a caterer, a dietitian, and a steward working together as a team. The food in that hospital is good; and, as we noted in our leader, the reforms which led to the appointment of the present officers indirectly lowered the cost of the department. Appointment of trained workers, including cooks, at higher salaries led to substantial savings in other directions, far outweighing the greater wage-bill. The buying was done more economically; proper checking prevented mistakes in quantities; and attractive menus, good cooking, and careful serving reduced the contents of waste-buckets. At this hospital there is already the framework for a full training school for dietitians, caterers, and stewards, which might well be developed on a large scale as soon as the war is over. At present difficulties of accommodation and staffing make such an undertaking impossible, though short-term courses have already been arranged, on behalf of King Edward's Hospital Fund, and have been well attended by assistant matrons, housekeeping sisters, stewards, and cooks.

Another example of improvement in catering has been reported from an EMS hospital.[1]

> This hospital received all provisions from the parent hospital, at which all the buying was done. The menu was arranged by a stores clerk, who was also responsible for issuing stores to the kitchen. Only daily quantities were issued, and they only reached the kitchen at 6 PM on the night before use; so nothing could be prepared in advance. Kitchen work was continually hampered by lack of essential equipment, such as vegetable knives, dishes, and trays, and containers to fit the trolleys. Shelving in the cold-storage rooms was inadequate, and the ovens were badly placed.
>
> The first measure was to place absolute control of the catering department in the hands of one man. The steward, working under him, continued to do the buying, and was given more help with the routine work of his office. A store of cereals and canned and dried goods was set up in the kitchen; flour was delivered there direct, rationed goods in bulk once a week, and meat at least a day in advance. This made it possible to plan ahead, to vary the menu, improve suppers, and get rid of unpopular commodities like black-pudding. Equipment and kitchen layout were improved, and better relationship was established between the different sections of the catering department. A pastry-cook was appointed, and later a dietitian with catering experience took over the post of catering supervisor. The structure of the kitchen side then became:



The article notes that the essential quality for a catering supervisor is a gift for sympathetic understanding of other people's troubles. The results of the reforms, which were accomplished within 5 months, were thoroughly satisfactory.

STAFFING AND EQUIPMENT

Evidently, then, we need more dietitians with experience of catering, and more arrangements for training

1. *Hospital*, May, 1944.

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them. But in the meantime, experienced caterers are to be found who can begin the task of reorganisation, especially if they have the advice of doctors interested in diet. After the war more of these experts will be released from the Forces and from canteen work, and they will prove valuable personnel not only to work with dietitians, but to train students of dietetics in catering. If a catering supervisor who knows his or her job is appointed, parsimony in the buying of food will be at an end. A comparable liberality must be shown in the staffing and equipment of kitchens and wards. Everyone must have the tools to do his job. Mechanical potato-peelers, good ovens, plenty of knives, forks, and spoons, enough dishes, enough proper containers, heated trolleys, hot-plates in the ward, trays, linen, and glass, and adequate washing-up equipment, are not luxuries but the bare essentials needed by those providing meals for patients. They must be provided ungrudgingly, in the knowledge that they are going to mean better food at less cost. Capable cooks are an economy. "She was a good cook, as cooks go," said Saki; "and as cooks go, she went"—probably because she was dissatisfied with the terms and conditions of service. Hospitals cannot afford either to pay bad cooks, or to let good cooks go.

Large hospitals can and should afford to make these reforms either at once, or step by step as staff and equipment become available. For small hospitals the problem is somewhat different. Expensive equipment, highly-qualified chefs, and supervisors accustomed to large-scale catering would naturally be beyond their needs. There is no reason, however, why they should not engage a well-trained cook, and provide her with equipment equal to the work she has to do. Moreover, they should place a single person in control of catering, and give him or her adequate powers. If they cannot find an appropriate person to appoint they should send the most likely member of the staff to take a course in catering, such as those arranged by King Edward's Hospital Fund, and should give her every encouragement to study the subject further, to take qualifications, and to visit the catering departments of other hospitals. Where possible, small hospitals should combine together to purchase goods, or should entrust their buying to a large hospital in the neighbourhood. The London Hospital catering department buys for a large number of smaller hospitals, to their great advantage.

NURSE AND MEDICAL STUDENT

A new attitude towards the feeding of the sick—or rather, a return to the old attitude—cannot be bred too early in the medical or nursing student. The seniors of our own profession should search their consciences to find out whether they have harped sufficiently on this string in their ward rounds and lectures. Has the student been interrogated as often, for example, about the details of diet as about mitral stenosis? Can he say with equal confidence what went down the patient's gullet from his plate and from his medicine glass? Has he tried the food in the wards himself? A week in bed in some hospital other than his own would teach him wonderfully. Then, can the student nurse recite confidently the likes and dislikes, the preferred size of helping, and the special foibles, of every patient under her care? Can she assert accurately within six hours of the patient's admission whether he likes his tea weak or strong, with sugar or without? Finally, have both nurse and medical student been given adequate teaching on food values and nutrition? Is there any reason why they should not take a preliminary course of lectures on these subjects together, so that they could understand one another's responsibilities and difficulties?

The hospital should lead the way in food education. No place is more suitable for people to learn what is the best food to eat. The nurse can do much to teach them, not only in the hospital ward, but in the district. If she learns to criticise her own food intelligently on student-nurse committees, she will be fitting herself to keep a critical eye on food in the wards and to help to maintain a high standard.

THE SUMMING-UP

It would be laborious to touch again on the many points of detail, noted in these articles, which go to make up good hospital feeding. Attention to detail will eventually raise the standard of hospital food, as it has raised standards in surgery and nursing. Principles, however, must come first, and it will suffice here to recapitulate those we believe to be fundamental:

It is the duty of his doctors and surgeons to see that the patient in hospital is properly fed.

Catering should be in the hands of one responsible person, who should have adequate powers.

The catering supervisor should be backed by a food advisory committee representing all those whose duties give them an interest in hospital food—the board, the doctors, the dietitian (who may be the catering supervisor), the matron, the steward, the ward sisters, and the cooks.

Medical and nursing students should be taught the importance not only of diet but of the feeding of patients—the elementary principle of getting enough good food into them to support them while they are fighting illness.

Finally, equipment must be adequate and kitchen staff properly trained. Poor equipment and a low wage-bill in the kitchen are an unjustifiable extravagance.

NEW INTERNATIONAL SANITARY CONVENTIONS

DRAFTED and sponsored by UNRRA, two new international sanitary conventions, amending those at present in force, came into operation on Jan. 15. By that date the signatures of 17 of the governments of the United Nations, including France, Poland, Great Britain, the USA, and China had been affixed.

Even before the war it was recognised that advances in preventive medicine had made the present conventions obsolescent; the one governing sea and land traffic dated from 1926, and the one on air travel from 1933. For example, the development of immunisation against yellow fever has required changes in the yellow-fever clauses of the air convention. Moreover, the migrations of large numbers of people expected after the war demanded special consideration, although the health measures needed for their organised movement have been dealt with by a special agreement between the governments concerned, which it is hoped will shortly be signed.

UNRRA was entrusted with the work because the Office International d'Hygiène Publique—the technical body concerned with the revision of the sanitary conventions—was then in enemy territory. Early in 1944 UNRRA's expert commission on quarantine, under the chairmanship of Dr. P. G. Stock of the Ministry of Health, completed the work—in a remarkably short time. The drafts of the revised conventions were approved in principle by the Council of UNRRA at its second session in Montreal last September, and were referred to the standing technical committee on health for final revision. Meanwhile Paris had been liberated and negotiations to safeguard the position of the Paris Office and to ensure its collaboration with UNRRA were successfully undertaken. The English and French texts of the conventions are equally authentic.

UNRRA, as a temporary measure, until a full international sanitary conference can be called, will administer the new conventions and receive and transmit intelligence about epidemics. Such information will not, as hitherto, be confined to the occurrence of the five "convention" diseases (plague, cholera, yellow fever, typhus, and smallpox); for signatories are now under an obligation to notify UNRRA immediately of the presence and course of any epidemic disease which may be a menace to other countries. Signatory governments also undertake to pass on to UNRRA as regularly as possible statistics of all notifiable diseases in their countries; and UNRRA in turn will distribute its information to the governments concerned.

In addition, the conventions make a new departure in that to UNRRA is entrusted the delimitation of zones in which yellow fever is endemic, and the setting up of approved standards of yellow-fever vaccine. Action has already been taken by the quarantine commission of UNRRA in these matters. The conventions also recommend the adoption by governments of model international forms of certificates of immunisation against various diseases.

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In England Now

A Running Commentary by Peripatetic Correspondents

BUDA-PEST. Ah yes, what a place! In exchange for talking English to the children of a Hungarian nobleman I was entertained for three months in Hungary during the summer of 1936. I spent the first two in the country shooting roebuck in Bekescaba and duck on the Tisca river. For my last month I lived in stately Buda, and used to cross the suspension bridge over the Danube and visit the Pest hospitals. As a second-year student with only an arm and a head-and-neck dissection to my credit I was treated with great respect. An introduction from high places got me an English-speaking gynæcologist as my guide. He entered into the game with enthusiasm, and delighted in introducing me to his non-English-speaking colleagues as "Doktor X, MD, of London"—they must have thought me an infant prodigy. I saw a mass of clinical material much of which was wasted on me. With my untutored eye I peered up cystoscopes, saw my first eclampsia, and as many as six confinements proceeding in one long room at once. The most memorable point of this exhibition was the uniform cry of "Yoi!" during the fiercer pains. The high light of surgery was four tables in one theatre. On one, I remember a noisy performance from a girl undergoing removal of scarred dura for epilepsy, and how a patient having a herniotomy under a local on the next table was unmoved by the cries. My most swollen-headed moment was when a surgeon of much local eminence waited half an hour for the arrival of "the London surgeon" to witness his method of gastro-enterostomy. The triumph was only marred by the presence of two New Zealand surgeons who, knowing my true professional status, ostentatiously asked my opinion whenever possible. The Hungarians were very friendly, and I wonder how they and their Fisherman's Bastion are standing up to the second Russian occupation within thirty years. I suspect that their geographical position and a too radical interpretation of their Versailles-born motto "Nem! Nem! Soha" has delivered them to their present predicament rather than any hatred of ourselves.

* * *

"Cash" in the village stores is rather a friend of mine. She is a thin delicate girl, often away ill, and has the eager gentle manner that one often finds in women of her type and physique. She sits all day on a high stool in her small glass box in a dark corner of the shop, and peeps out at one with bright eyes, like a friendly mouse. She loves to have a talk about Life in general, and our latest exchange of views was when I rang up about my weekly order. We progressed from coffee, via snow, my husband's strange choice of January for his last summer's leave, and slippery roads, to old age. Cash pities old people very much. "My mother," she concluded (she always quotes her mother), "says there is no pleasure in growing old in these times. There's nothing nice to eat, nowhere to go, and nothing to look forward to." This masterly summary of a point of view which must be shared by many ageing people left little to be said but a friendly farewell. It seems a singularly inadequate philosophy for a thinking being; and it is not confined to the working classes, either. Even a highly cultured friend of mine, a Unitarian minister and a writer, bewails old age, and refuses to agree with Browning's

> "Grow old along with me;
> The best is yet to be,
> The last of life for which the first was made."

We have not really progressed much beyond the background of the Trojan War, in spite of 2000 years of Christianity.

* * *

Edward Grey thought he could hear a flycatcher singing more clearly if he watched him through glasses. If one notes a particular singer in a choir one seems to hear his voice above the hubbub and after a while one appears to gather what manner of man he is—perhaps moustached, married, with mind set or undulated hair, flighty, not yet permanently mated. It is as though eye and ear reinforced each other's power. Do the other senses act in this cumulative way too? I think so. If you put your hands on the wireless and feel the vibrating voice, you may not be able to hear better, although I think you do slightly, but the auditory and tactile senses certainly try to make up for the absent sense, the visual, by giving a clearer picture of the speaker and his surroundings. After all, the senses have been acting in conjunction for a good many millennia now, and if you are reduced to one you soon go to sleep, as when you shut your eyes listening to the wireless or a sermon and in hypnosis. Nor are the so-called five senses the only ones employed in augmentation; the whole body thinks except the strictly keratinous—that is to say, sends afferent impulses, from which thought and perception is an efferent. A difference between the impulses coming from the finger tips and the psoas is that the former's originator was lucky enough to draw an outside position, but, of course, is denied inside information. The emotions too differ from the other afferent impulses only by delivering their message by the old autonomic postman to the thalamic post office and not by phone. Years ago I used to go to service in the village church with my mother. I sat on her right side and often used to turn my head to the left to look at her. Nowadays if I hear church music and turn my head to the left I recapture her picture with clarity; I don't if I turn my head to the right. If the musty smell of village churches and the gluteal oppression of a pew is also present, then on turning my head to the left I get a vision of almost hallucinatory clearness. Under certain conditions I can see a favourite lake in December twilight. I was going on a long voyage next day and I went down to have a last look at it, grey and gloriously dismal in a north wind and snow. I crouched down behind the sedges to suck it all in, and nowadays I can see it like an etching if I crouch down in a cold wind.

Clearly this is an important subject and has relevance to clairvoyance, hallucinations, hearing-aids, help for the blind, and the inducement of thirst by beer advertisements.

* * *

She was a damsel of generous proportions—I should have placed her in the 12 stone class. I winced as she seated herself solidly on the bed, prepared to examine the patient to whom I had introduced her as material to her passage to MB. Her approach to the problem suggested that she had either no time-sense or a curiously heterodox procedure in the investigation of disease. By means of quite improper leading questions I invited her to consider the possibility of bronchiectasis. Her acquiescence was enthusiastic and uncompromising. Interrogated as to further steps in order to establish this diagnosis, she expressed a desire to perform bronchoscopy. Had she the appropriate instrument in her handbag? She had not (the sarcasm was unheeded). Well, why not employ one of the senses with which she had been conveniently endowed; that of smell for example? Was she not aware of something obtrusive, stealing upon the air? "I've got a bad cold," she answered. That was one up to her: and then the bell rang.

Meditating upon the olfactory, I was reminded of another examination episode. I was associated with a very short-sighted pharmacologist in the oral examination of an exceptionally attractive young lady whose charms had not been without effect during her previous experiences of the other tables. Her mental equipment was by no means commensurate with her physical, and her beauty was thrown away on the undiscriminating myope who dryly observed to me as her highly perfumed person left the room: "I think we shall smell her again."

The young man who had been asked to give an opinion upon a cardiac lesion—what might be popularly termed a roaring aortic murmur, refused until he had been provided with an X ray of the chest, an electrocardiogram, and an estimation of the sedimentation-rate. I pondered with some sadness on the past, when our predecessors conducted their practice unencumbered save with the monaural stethoscope discreetly and conveniently concealed in the professional silk hat. And they did very well. It looks as if the practitioner of the future will require adventitious aids which will make him look like a travelling circus. And I suppose somebody (not I) will have to educate him accordingly.

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Parliament

GOODENOUGH RECOMMENDATIONS

THE Minister of Health announced in the House of Commons on Jan. 18 that the Interdepartmental Committee on Medical Schools had recommended a comprehensive programme for the reform and development of medical education and research. Certain of the matters, he continued, would require legislation, and these the Government propose to discuss with the bodies concerned. Apart from these the committee's recommendations are in the first place for the responsible educational authorities to study in framing their future policy, and the Government accordingly invite universities, medical schools, and teaching hospitals to give the report early consideration.

Recognising the fundamental importance of medical education and research to the future of the country's health services, the Government accept the principle of increased grants for the purposes of medical education and research, to be distributed by the University Grants Committee through the universities to medical schools, postgraduate schools and institutes, and hospitals used for teaching and research. They also accept the suggestion that for a limited period these additional grants should be separated from the block grants received by universities for their work as a whole. The amounts of grant to be made from time to time, whether for capital or for recurrent expenditure, will be determined after consideration in the light of the recommendations of the University Grants Committee and the general financial position prevailing.

The Government share the views expressed in the report on the importance of affording to women equal opportunities to those enjoyed by men for medical training and for obtaining postgraduate experience. They have, therefore, decided, as recommended by the committee, that future payments of grant to medical schools should be conditional on the adoption by the schools of the principle of admitting a reasonable proportion of students of both sexes. They recognise that schools at present open to one sex only may need periods of varying lengths to adjust their arrangements to a co-educational basis, and they therefore propose that the University Grants Committee in consultation with the university authorities concerned should be charged with the responsibility of determining from time to time whether the action taken by each of these schools complies with the principle to the extent that is reasonable.

The Government attach equal importance to the revision of the medical curriculum, and their acceptance of the principle of increased grants for medical education and research is dependent on the early completion of this process. They are, therefore, glad to learn that, as recommended by the committee, the General Medical Council has already taken the initiative in the matter.

QUESTION TIME

Emergency Medical Service

Mr. W. S. LIDDALL asked the Minister whether, in view of the fact that throughout the country many people were unaware of the activities of the Emergency Medical Service, he would make a statement on the valuable services that had been and still were being rendered.—Mr. WILLINK replied: I can hardly deal adequately in an answer to a question with the widespread activities of the Emergency Hospital Scheme, which provides treatment not only for the sick and wounded of the Forces and for air-raid casualties, but also for many classes of civilian sick and injured. The scheme has also developed such allied services as rehabilitation, blood transfusion, laboratories, and ambulances. There may be an opportunity of reviewing the scheme as a whole on some future occasion such as a debate on the Estimates. I should like, however, to pay my tribute now to the hospital authorities, and to the medical, nursing, and other staff of the hospitals, who have coöperated so well with my officers in making the scheme a success.

Mr. F. MESSER: Does the Minister agree that this is an excellent illustration of the efficiency of large-scale medical service.—Miss HORSBRUGH: It is certainly a success as a scheme, through the coöperation of all those working for the sick and injured.

Deaf Aids Committee

Sir DOUGLAS HACKING asked the Lord President of the Council whether he would give the names of the members of the committee which had been appointed to advise and assist the Medical Research Council in promoting research into electro-acoustical problems relating to the design and application of instruments in alleviation of deafness; and whether he had anything to report as a result of the labour of this committee.—Mr. C. ATTLEE replied: The names of the members of the committee are as follows: Mr. W. C. Radley (chairman); Mr. E. J. Barnes; Sir Lawrence Bragg, FRS; Mr. N. Fleming; Mr. C. S. Hallpike, FRCS; Mr. L. C. Pocock; and Mr. T. S. Littler (secretary). The committee have formulated a detailed programme of research, and investigations in which physicists are collaborating with otologists and physiologists are in progress. The investigations now in hand will necessarily take some time to complete, and it is not anticipated that the committee will be in a position to make any recommendations before the end of the year.

Nurses Bill

On Jan. 17 the Earl of LISTOWEL introduced a Bill in the House of Lords to exclude county and district nursing associations and other similar organisations from the operation of part II of the Nurses Act 1943, and part II of the Nurses (Scotland) Act 1943.

Tuberculous Repatriated Prisoners of War

Miss I. WARD asked the Secretary of State for War whether he was aware of the dissatisfaction of relatives with the arrangements made for repatriated prisoners of war suffering from tuberculosis; and if he would consider these complaints with a view to an alteration of the present policy.—Sir JAMES GRIGG replied: It is the policy of the Army to discharge soldiers suffering from tuberculosis as soon as possible, so that if necessary they may enter civil sanatoria near their homes. Repatriated prisoners of war are given special consideration, but I am aware that there is sometimes delay in admission owing to pressure on accommodation. The Minister of Health has therefore set aside a number of beds in EMS hospitals for Service patients awaiting transfer to sanatoria. This should materially help to remove any cause for complaint.

Dr. EDITH SUMMERSKILL: In view of the fact that these men contracted the disease in the Army, can the Minister say why he is shelving his responsibility in this matter?—Sir J. GRIGG: Because that happens to be the arrangement prescribed in the Army regulations. The Army do not look after tuberculosis patients. Patients discharged for disability in the Army are looked after in the case of tuberculosis by the Ministry of Health, and in the case of other diseases in Ministry of Pensions hospitals.

Discharge of Men of Low Medical Category

Mr. W. J. BROWN asked the Minister whether he was aware that, as the Government's interim demobilisation plan made no provision for exceptional treatment of officers and other ranks relegated to low medical categories unfitting them for further combatant service, such persons were now retained on sedentary work in home establishments; and whether, to facilitate their rehabilitation in civilian life, he would arrange that persons sent back to this country on relegation to medical category C might be granted honourable discharge in advance of the demobilisation plan.—Sir JAMES GRIGG replied: The present man-power position does not enable us to dispense with the services of officers and men who can be usefully employed in the Army. Those working in home establishments are, in fact, releasing fitter men for employment overseas.

Food Subsidies

Sir W. SMITHERS asked the Chancellor of the Exchequer what is the latest figure of the annual amount found by the taxpayer to keep the cost of food prices at 68 points above the 1914 level.—Sir J. ANDERSON replied: The latest estimate of the cost of the food subsidies is that they are running at the rate of £218 million.

National Loaf

Colonel J. LLEWELLIN informed Sir E. GRAHAM-LITTLE that the national flour content of the national loaf is approximately 75%. When milling 82½% extraction flour the 17½% abstracted contains about 90% of the total fibre of the wheat grain together with small quantities of the other constituents which adhere to the branny particles during the milling process.

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Empire Casualties

In answering a question the PRIME MINISTER circulated the table given below, showing the casualties to all ranks of British Commonwealth and Empire forces reported from Sept. 3, 1939, to Nov. 30, 1944.

	United Kingdom	Canada	Australia	New Zealand	South Africa	India	Colonies	Total British Empire
Killed, including died of wounds or injuries	199,497	28,040	18,015	8,919	5,783	17,415	4,493	282,162
Missing	39,383	4,807	6,913	928	599	13,935	14,015	80,580
Wounded	235,207	39,010	34,336	17,115	11,796	45,224	3,686	386,374
Prisoners of War including Service internees	161,020	7,128	25,597	7,153	10,765	76,023	6,752	294,438
Total	635,107	78,985	84,861	34,115	28,943	152,597	28,946	1,043,554

Paper for Medical Books

Major NEVEN-SPENCE asked the President of the Board of Trade whether he was prepared to increase the paper quota available to the medical group of publishers in order to counteract the growing decline in the production of medical books.—Captain C. WATERHOUSE replied: Quotas of paper are based on publishers' pre-war usage, and do not vary with the types of books they produce. Last autumn, however, a substantial increase was arranged in the special reserve for books of particular importance, including medical books, which publishers cannot produce from their quotas.

Major NEVEN-SPENCE asked the Minister of Labour whether he was prepared to secure the release of key men in the printing, engraving, and binding trades employed by the medical group of publishers in order to overcome the serious decline in the production of medical books.—Mr. ERNEST BEVIN replied: I am not aware that publishers of medical books are prevented by labour difficulties from making full use of the paper available to them.

Hernia in Miners

Mr. NESS EDWARDS asked the Minister of Fuel and Power if he had had examined the large number of cases of hernia occurring in the mining industry; to what extent the incidence of this type of disability could be reduced if a tub of lighter construction was introduced; and if he would take steps to have this matter investigated.—Major S. LLOYD GEORGE replied: Exact figures of the incidence of hernia in the mining industry are not available, but such information as I have does not give ground for thinking that the number of cases is abnormally large. The figures of applications by miners to leave the industry on medical grounds show that in only about 1% of the cases is hernia advanced as the cause of disability and the ground for the application. I am advised that the weight of tubs, which, of course, varies from mine to mine, is only one of several factors which may cause, or contribute towards, hernia, and many other considerations would have to be taken into account before tubs of lighter construction could be introduced. In so far as the man-handling of tubs is a contributory cause of hernia, the remedy would appear rather to lie in effecting improvements in the haulage system, which is one of the matters before the technical advisory committee now sitting.

Nursery Schools

Captain J. H. F. MCEWEN asked the Minister of Education what had been in England the cost of nursery schools set up since the war; and how many children had made use of them.—Mr. R. A. BUTLER replied: Three nursery schools have been established by local education authorities in England during the war at a capital cost of about £16,000; in 1943–44 the net maintenance expenditure was £5280 and the average attendance 240. Three nursery schools were established by voluntary bodies. I have no figures of their capital cost; in 1943–44 the net maintenance expenditure was about £1730 and the average attendance 125.

Birth Certificates

Commander O. S. LOCKER-LAMPSON asked the Minister of Health whether he would now reconsider the type of certificate of registry of births so as to simplify matters and avoid unauthorised and needless details when certificates were asked for.—Mr. WILLINK replied: A person acting in the statutory capacity of informant for the registration of a birth is entitled to obtain from the registrar an acknowledgment that this statutory duty has been discharged. I am not prepared to restore the present form of acknowledgment to that of the form which was superseded some 20 years ago because it did not satisfy its sole purpose as above described and contained particulars which made it the equivalent of an irregular birth certificate. The earlier form, if restored, would not satisfy the requirements of the numerous statutory provisions as to evidence of age.—Sir E. GRAHAM-LITTLE: Will the Minister take particular care that there shall be no information in such certificates involving breach of professional secrecy?—Mr. WILLINK: Certainly.—Commander LOCKER-LAMPSON: Will the Minister receive a deputation so that we may press the claim?—Mr. WILLINK: I am quite prepared to consider that.

Direction of Doctors in War-time

Sir ARTHUR EVANS asked the Minister of Labour what was the present position of the Cardiff doctor, now in general practice in that city, who was found guilty of failing to comply with the direction of a National Service officer under the Defence (General) Regulations, requiring him to undertake a resident hospital post and, as there was no appeal against such a direction and conscientious objection was only recognised in the armed Forces of the Crown, what action he proposed to take to ensure that Regulation 58A was complied with.—Mr. BEVIN replied: The doctor in question failed to comply with a direction to take up a post in a hospital, alleging conscientious objections. For this offence he was convicted and fined, but he remains liable to be directed to other suitable employment and directions will be issued accordingly if and when a post is found for him which is suitable, having regard to his experience, qualifications, and other circumstances.

Milk-supplies

Sir PERCY HURD asked the Minister of Agriculture what steps were being taken to enable the general public to obtain a more adequate ration of liquid milk.—Mr. TOM WILLIAMS replied: Steps are being taken to encourage by all practicable means a further increase in milk production, particularly in the winter months.

Sir P. HURD: Was the Minister correctly reported as stating that we shall not have a better ration for the general public till 1949?—Mr. WILLIAMS: I think the Minister said that he feared that it might not be possible completely to abolish rationing before 1949. Year by year since 1939 there has been a continued increase in the production of milk.

Bedding and Upholstery Fillings

Mr. H. THORNEYCROFT asked the Minister of Health whether he had yet considered the representations made to him by the Manchester city council upon the use of unclean fillings in bedding, upholstery, and other domestic articles; and would he, in the interests of public health, take steps without delay to grant to local authorities further statutory powers to enable them to ensure the cleanliness of all fillings used in the manufacture of such articles.—Mr. WILLINK replied: As indicated in a letter sent to the council on Dec. 22, arrangements are now being made for the resumption of the sittings of the departmental committee which has this whole subject under review.

Friendly and Approved Societies

Sir PATRICK HANNON asked the Minister of National Insurance if his attention had been called to the confusion which had arisen among large numbers of people in their failure to realise the distinction between Friendly and Approved Societies; and if he would indicate briefly the purpose and function of these bodies, respectively, in relation to the Government's proposals.—Sir WILLIAM JOWITT replied:

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Letters to the Editor

DENTISTRY OR STOMATOLOGY?

SIR,—There will be no praise for Mr. Bowdler Henry's scheme of reconstruction (*Lancet*, Jan. 6), but he is to be congratulated upon his courage in propounding it, knowing, as he must, that it will be received with the utmost disfavour and concern by the vast majority of his professional colleagues. This scheme cannot, and doubtless will not, go unchallenged. The "dentists" will have much to say; but since the "prosthetists" are to be relegated in it to an even lower grade, it is fitting that the reaction of a prosthetist should be sharper and more immediate.

Mr. Henry appears to be worried mainly by two things—the status of the profession, and the practical nature of the work it involves. The lack of status he attributes mainly, if not wholly, to the practice of dental prosthetics; for the second he blames the Odontological Society which first planned the curriculum. As to status, a man surely is judged upon his *merits*, both social and professional, and he stands or falls by these and these alone. It is true that the status of the dental profession has been questioned—although, as a dental surgeon of some experience, I must confess that I have never been conscious of a lack of it—but I am convinced that any deficiency is in no way due to the practice of dental prosthetics.

Mr. Henry's ethical conscience is smitten because, legally, the fitting of dentures is a "sale of goods." There are few prosthetists who would not agree that, legally or not, dentures are in fact a part of treatment. Morally, he says, it is not right that he who condemns a patient to lose teeth should profit by their replacement by artificial means. Can it not be maintained that there is in fact a moral obligation so to replace them? He must be reminded too that the question of profit does not arise in a public dental service as visualised. Modern immediate denture prosthesis, the only correct prosthesis, entails a technique which cannot in any way be divided between him who extracts the teeth and him who replaces them by artificial means. Yet Mr. Henry would delegate the one task to the "dentist" and the other to the "prosthetist" (who has not been trained to extract teeth), thus perpetuating the barbarous practice, still unhappily extant, of rendering a patient edentulous and keeping him so for a period of six months before inserting the so-called permanent dentures.

Mr. Henry complains that the curriculum today remains fundamentally practical; but is not dental surgery essentially a practical profession? And so it will remain until prevention, the panacea for all its ills, has become an established fact; or until cures for caries and pyorrhœa revolutionise the practice of dental surgery. The dental profession is to be disarticulated in order to stimulate activities in the field of prevention, and in the process the status of the many will be inevitably lowered. Whatever may be hoped to the contrary, the stomatologist (or call him what you wish) will remain a "dentist" in the public mind, and the status of the profession will be fixed by that of the greatest number. Mechanics is a rapidly dying craft among practising dentists, while prosthetics is enjoying an Indian summer. Logically, the latter is doomed as prevention comes to the forefront. The time spent upon the practice of prosthetics even today need not detract from activities in the other fields of dental surgery: therefore do not kill it off, let it die a natural death. Vast uncharted seas lie in the realm of prevention, and offer rich rewards, but in setting out let us not in our enthusiasm cast overboard the practical man and his work.

There are basic weaknesses in Mr. Henry's scheme. Firstly, as I understand it, dentistry and prosthetics come off the common trunk of basic medicine, and presumably their special training takes place entirely *within the branch*. How then is the stomatologist (who has by-passed that branch) to be in a position to supervise work in which he has had no training or experience? It is manifestly absurd. If this supposition is incorrect, on the other hand, and if in fact the stomatologist has to "waste time" in learning these subjects, the whole scheme falls to the ground, for are we not then back to where we are at present? Secondly, the various branches of medicine and the proposed ancillary services spring from a common trunk of basic medicine, which trunk, be it noted, has its roots in a common entrance examination. That is to say, the lowest grade of dental auxiliary (somewhere about the level of radiographer) must attain the same standard of preliminary general and scientific education as the cardiologist, the ophthalmologist, and the stomatologist. But what status—to say nothing of living standard—is offered to these workers? The basic educational requirements are to be the same but the rewards are to be less. Surely a poor reward for a very good start. This relegation of dentistry and dental auxiliary services to a lower plane will aggravate still further the greatest single problem confronting the Interdepartmental Committee today—that of dental man-power—by discouraging entrants to the profession still further: there will be too little to offer in stomatology for very high qualification, and too little to offer in dentistry or prosthetics in the way of status. Practical dental surgeons are still needed urgently. This scheme will most effectively cut off the supply. Finally, after the dental profession as such has been thus disembowelled, what is left for the highly qualified stomatologist? While the dentists and the prosthetists grovel in the gloom of obscurity the stomatologist shines in his glory and does—what? Signs forms and advises? Practises oral surgery? If the latter, why does he not take the FRCS as well as the LDS and have done with it? In years to come dentistry may become a branch of medicine, but for some time yet it will remain allied to surgery. With few exceptions, the dental surgeons who have proceeded to the highest surgical qualifications have left the profession altogether. The reason? Dental surgery has for them become too restricted a field, and so it would remain for the stomatologist. This way of solving our problems leads to disaster.

London, W2. ARTHUR G. ALLEN.

STRESS FRACTURE OF THE FIRST RIB

SIR,—Both in your annotation of Jan. 6 and in B. R. Alderson's paper (*Brit. J. Radiol.* 1944, **17**, 323) my name is mentioned. Perhaps, therefore, you will permit me to disagree with each of you in turn?

Since Alderson first showed some of his radiographs before the British Institute of Radiology, I have been studying extensively the question of anomalies of the first rib. My search has brought to light once more Arbuthnot Lane's experimental work in the dissecting-room as far back as 1885, and I call his papers in support of my considered opinion that firstly, the anomalies to which Alderson refers are not "stress" fractures at all, and secondly, that your statement—"while fractures of rib by muscular violence are not rare, the first rib is only uncommonly involved"—is not supported by the facts. Having discussed his most interesting paper with him, I believe that Alderson is applying the term "stress fracture" without adequate evidence and almost certainly incorrectly.

Detailed study of thousands of films of first ribs will, I am convinced, support Lane in his view that the first rib is much more often fractured than has hitherto been conceded. He believed, and demonstrated, that the statement made in so many textbooks that "the first and second ribs are *protected* by the clavicle" is quite

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A friendly society is a voluntary mutual association formed for the purpose of making provision for its members mainly in respect of sickness, old age, and death. An approved society is a self-governing organisation responsible for the administration of the cash and additional benefits to which its members may be entitled under the National Health Insurance Acts. Approved societies are of various origin, and many friendly societies are approved for the purpose of conducting National Health Insurance business for their members. The proposed new scheme of National Insurance will leave friendly societies free to carry on their voluntary activities, but, as stated during the recent debate, the Government take the view that the new benefits should be directly administered by a ministry of national insurance, and not by a system of approved societies.

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insupportable, and that in fact pressure by the clavicle on the first rib is often a prime factor in the production of injuries thereto. Thus:

> "If in another subject the outer end of the clavicle be forced backwards, so that it rests upon the first rib outside its tubercle, being separated from it by the scalenus medius, and a heavy blow be struck horizontally backwards on its padded outer extremity, in some rare cases the inner end of the clavicle is dislocated forwards, but in the large majority of cases the first rib is fractured at the point of impact. The facility with which this fracture of the first rib is produced is remarkable, and if one compares the relative thickness and strength of the first rib and clavicle and the mechanical advantage of the action of the clavicle upon the first rib, one would not be surprised to find this fracture occur not uncommonly during lifetime."
>
> (Lane, W. A. *Guy's Hosp. Rep.* 1885).

The essential feature in deliberate assessment of the truth of the various claims made is to realise that Lane was studying the whole of the anatomy of the spine, sternum, ribs, and ligaments, and their interplay, and meant by first rib "first rib plus its cartilage"; whereas many studies based on radiography alone (and I believe Alderson's to be such) are incomplete, because they fail to reveal or to take sufficient cognisance of the whole of the first rib (and the sternum) and deal only with the bony portion of the first rib.

There is, I think, abundant evidence that fracture of the first rib "unit" is probably much commoner than Alderson has shown. It results from violence applied to clavicle, sternum, or (under certain conditions) cervical spine, being frequent in collision accidents. It certainly occurs, somewhat rarely, solely as a result to muscular action. But I maintain that no evidence whatsoever has been adduced to justify the description of "stress fracture" of the first rib.

I strongly urge that, in order that the true nature of "stress" or "fatigue" fracture shall be clearly understood, and the literature not obscured either by reports of fractures of violence or examples of pseudo-fracture, the terms be not used unless there is real evidence that: (*a*) the bone affected is not diseased; (*b*) no violence has occurred which could have accounted for fracture; and (*c*) the patient has been subjected to repeated sub-threshold stresses, which, either by the frequency of their repetition, or being superimposed upon some other stress, might reasonably be shown to cause infraction at the site under discussion. Meanwhile, there seems to be no authoritative work to be placed against Lane's exhaustive studies which led him to the belief that fractures of the first rib were more common than was supposed, and that they were of traumatic origin.

Manchester. J. BLAIR HARTLEY.

HEALTH OF CHILDREN IN WAR-TIME DAY NURSERIES

SIR,—On Nov. 25, 1944, you drew attention to some of the doubts that have been expressed about the value of day nurseries to the health and well-being of young children, mentioning particularly the criticisms raised by Dr. Helen Mackay and Dr. Marjorie Back at a meeting of the Medical Women's Federation. The Federation, realising the importance of this subject in relation to post-war planning for child welfare, has not allowed the matter to rest. Is day-nursery life beneficial in the long run to the health of young children or is it not? Opinion is divided and recorded evidence is scanty. It may be of interest, therefore, to make known a scheme of research which is being organised by the Medical Women's Federation into the health of children in war-time day nurseries compared with children of similar ages not in nurseries.

The scheme falls into two parts. One part comprises an investigation by a whole-time clinician covering a comparatively small number of children but extending over a period of a year. This is already being carried out by Dr. Margaret McLaughlin, on behalf of the Medical Women's Federation, in Birmingham, and we are greatly indebted to the medical officer of health and his staff in that city for making it possible to undertake the work. In the second part it is intended to compare the results of a single examination (relating especially to the evidence of respiratory infection) of a much larger number of nursery and non-nursery children throughout the country. For this the Federation will seek the coöperation of medical officers of health in many areas.

The purpose of the investigation is to obtain evidence which may have a bearing on the value of day nurseries, at least in so far as the health of the children is concerned, and which to that extent may be of assistance in determining future policy regarding day nurseries.

JANET CAMPBELL, President.
KATHERINE M. HIRST, Chairman,
Medical Women's Federation. Day Nursery Committee.

PENICILLIN FOR SYPHILIS

SIR,—The introduction of penicillin into syphilotherapy recalls the years immediately following the last war when what was then the new, potent, and quick-acting antisyphilitic remedy—neoarsphenamine—often failed to confer immunity from relapse where it was used without a supporting heavy metal. Relapse was far more frequent with neoarsphenamine in those days than it is with penicillin today; but it might not be unprofitable to have in mind the experiences of earlier times when seeking to use to the best advantage this new drug that is so lethal to the treponema, so harmless to the host.

In your leading article of Dec. 30, 1944, favourable comment was made on the combined use of arsenic and penicillin. One would ask if there are objections to the use of bismuth along with penicillin; for there are theoretical grounds for suggesting that, if not antagonistic to the action of penicillin, bismuth is a more logical adjuvant than arsenic. During the 8–10 days of penicillin administration it should be possible to give a number of injections of bismuth metal, or of one of the relatively insoluble bismuth salts, the therapeutic action of which would be maintained for many weeks. This might achieve better results than by supplementing penicillin, which is excreted within a few hours, with arsenic, the effect of which is generally regarded as lasting only a few days.

One has every sympathy with the clinician who naturally wishes to ascertain what penicillin by itself can accomplish, without assistance from either of the older-established remedies. Better results, however, were claimed for the intensive courses of oxophenarsine when bismuth was added; and a little bismuth might go a long way towards making permanent in more nearly 100% of cases the brilliant early results of the penicillin treatment of syphilis.

Dagenham, Essex. ROBERT FORGAN.

MALIGNANT MELANOMA

SIR,—I should like to defend Miss Tod's statement about the "incompetent treatment." Is it realised that most pigmented moles which are treated are removed by the hairdresser by electrolysis at 6*d*. per treatment?

Farningham, Kent. H. M. DENHOLM-YOUNG.

CARE OF LABORATORY ANIMALS

SIR,—Last year we wrote to all holders of the Home Office licence asking them to send us information for use in the forthcoming UFAW handbook on the care of laboratory animals. Thanks to valuable help from workers in Britain and also in America, Russia, and elsewhere, it has been possible to discuss the care of most if not all the smaller laboratory animals, but we are anxious to get into touch with those who have been successful in maintaining healthy stocks of the larger species—cats, dogs, and the smaller ungulates and primates. These species will not be dealt with in detail in the handbook, but we should like to include references to published accounts of methods of maintaining healthy and contented stocks, and also to mention laboratories at which advice on the subject can be given at first hand. We should be grateful if those who could help in either of these ways would get into touch with us as soon as possible, at 284, Regent's Park Road, London, N3.

Universities Federation for Animal Welfare. C. W. HUME. F. JEAN VINTER.

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UNIVERSITY STUDENTS AS CRITICS OF FACTORY LIFE

SIR,—In your annotation last week you state that "medical examinations were said to be perfunctory in the extreme." This is misleading. The statement is derived from the remarks of one student who thought that the workers unjustifiable (*sic*) distrust of the medical facilities might be due to the impression left by the routine inspections. These inspections were only intended to sort out cases with obvious dermatitis and should not be confused with other types of medical examination.

It would be unfortunate if members of a medical service who were responsible for initiating an important piece of medical research, and who gave us exceptional help and facilities, should be misrepresented. The paragraph on medical services in the original article was intended as a comment on how little the average worker understands what is being done for him, not as a criticism of the existing medical services, which were in fact very good.

Oxford. ALICE STEWART.

WHO SHOULD FEED THE SICK?

SIR,—For the first 4½ years of the war I was matron of a voluntary hospital, where I was responsible for the catering for 400 persons daily. It was my first care that everyone able to take ordinary diet should receive a full share of all rationed articles, and I cannot remember a single complaint from a patient, while a number expressed appreciation.

The great difficulty lay with the resident medical staff, who expected and demanded a higher standard of catering and an excessive share of the rationed foods. From them I received frequent complaints, which were also made to members of the committee. I was told that in their experience the resident medical staff of other institutions were not rationed so strictly. On one occasion the entire "house" staff left the hospital to get a meal outside, because the meat was tough! There were threats of resignation unless matters were improved, and I lost several members of a reduced domestic staff as a direct result of continuous complaints and criticisms. Complaints were always investigated, but were almost always found to be unjustified; and one resident joining the staff direct from the Services was kind enough to come to tell me that he considered the food was excellent. He was obviously disgusted by the attitude of some of his fellows.

As an administrator of some years' experience, I know that this is no isolated case, and that it demands great strength of mind to stand firm against the innumerable difficulties resulting from the attempt to assure really fair rationing. Naturally, the caterer is anxious to satisfy everyone, and recognises that the very hard-working staff deserve and should have the very best that can be provided within the rationing scheme. The task would be enormously lessened if young resident officers realised that hospitals are rationed like households, that one member can only exceed his or her share at the cost of another, and that with the double difficulty of rationing and of domestic shortage it is impossible to attain the standards of a first-class pre-war hotel.

ADMINISTRATOR.

SIR,—Members of my society are keenly interested in your illuminating discussion of this subject. They would like to help.

Caterers sometimes are hospital patients and have had repeated occasion to observe weaknesses in hospital catering which they believe they could remedy. As we see it the principal defect is not in dietetic knowledge but in organisation. We can confirm that, in many instances, hospital catering could be vastly improved, and at the same time its cost could be reduced, by expert buying, checking, costing, and cooking, as in the example you mention.

A major weakness in the academic domestic science training, we have found, is that, as you say, "first-hand experience of large-scale catering is not at present considered essential for the diploma." Some students who qualify for these diplomas develop aptitude for the hard practical work of large-scale catering with experience in it. Others do not. A wide gap between theory (or dogmatic opinion) with facility to expound it, on the one hand, and practical ability to do, is conspicuous in this field.

The council of my society would be very willing to appoint a panel of caterers, with well-tested practical experience in various kinds of large-scale catering, who would gladly serve, in an honorary capacity, on hospital food service committees, or in other ways help to overhaul catering arrangements at hospitals. If any hospital authorities who may be interested care to communicate with me, we shall do our best to advance the suggestion in a practical way.

National Society of Caterers to Industry, 83, Pall Mall, London, SW1. ARTHUR LAWSON, Secretary.

*** A correspondent commenting on our reply to Sir Robert Hutchison last week suggests that the fat ration does not amount to 77 g. per day, but only to about 32 g. It should be explained that 77 g. represents the total fat in the ration, including fat present in butter, margarine, cooking fat, cheese, bacon, milk, and meat to the value of 1*s.* 2*d.* The amounts of fat found in milk and meat vary, of course. The Ministry of Food has estimated that the daily fat allowance from all foods available (not merely rationed foods) averages 88 g.—ED. L.

Public Health

VITAL STATISTICS OF SEPTEMBER QUARTER

THE Registrar-General reports that in England and Wales during the last September quarter the number of births was 14,352 more than in the same quarter of 1943. It represented a rate of 17·6 per 1000, the highest third-quarter rate since 1926. In the first nine months of the year live births totalled 567,130, compared with 522,287 in the same period of 1943. The infant-mortality rate for the September quarter was 40 per 1000 live births; the death-rate was 10·3 per 1000, against 9·4 in the same quarter of 1943. The natural increase of population was 76,340, the corresponding increases for 1941, 1942, and 1943 being 46,285, 71,000, and 70,833.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED JAN. 13

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1330; whooping-cough, 1678; diphtheria, 459; paratyphoid, 5; typhoid, 5; measles (excluding rubella), 10,979; pneumonia (primary or influenzal), 1399; puerperal pyrexia, 127; cerebrospinal fever, 53; poliomyelitis, 7; polio-encephalitis, 3; encephalitis lethargica, 4; dysentery, 302; ophthalmia neonatorum, 58. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Jan. 10 was 985. During the previous week the following cases were admitted: scarlet fever, 46; diphtheria, 29; measles, 59; whooping-cough, 23.

Deaths.—In 126 great towns there were 1 (0) deaths from enteric fever, 3 (0) from scarlet fever, 18 (2) from measles, 13 (1) from whooping-cough, 5 (1) from diphtheria, 52 (2) from diarrhœa and enteritis under two years, and 52 (2) from influenza. The figures in parentheses are those for London itself.

Liverpool reported the fatal case of an enteric fever. There were 6 deaths from influenza at Liverpool, 5 at Birmingham, and 4 at Manchester.

The number of stillbirths notified during the week was 203 (corresponding to a rate of 30 per thousand total births), including 18 in London.

VITAMIN C AFTER MEALS.—In an investigation of vitamin C reserves in RAMC personnel, W. R. G. Atkins and R. A. Fisher (*J. R. Army med. Cps*, 1944, **83**, 251) observed that men receiving ascorbic acid after breakfast became saturated much sooner than those who received it before breakfast. No other differences in the two groups were apparent, and the conclusion must be that vitamin C is more effective if given on a full stomach.

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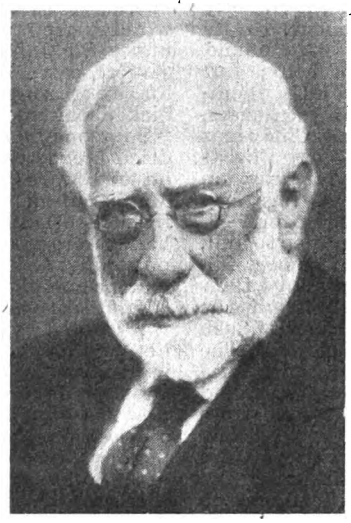
Obituary

THOMAS BARLOW

BT, KCVO, M D LOND., D SC, L LD, F R C P, F R S

THE medical profession may well give thanks for the long and valuable life of Sir Thomas Barlow, 1845–1945. His contributions to science were equalled by his contributions to practice through the example of integrity and noble aims. From the beginning to the end of his 74 years as a doctor he worked effectively for the good of the profession he loved.

He was born on Sept. 4, 1845, at Edgworth in Lancashire, son of James Barlow, JP, and Alice Barnes. From Owens College, Manchester, he passed to University College, London, and took his B Sc at the age of 22. Qualifying rather late, in 1871, he went through all the resident posts at University College Hospital, where he was known for his shrewdness and sympathy—flavoured with a touch of Lancashire. In his next appointment, at the Hospital for Sick Children, Great Ormond Street, he won the following tribute from Robert Bridges, then a student: "Of all the doctors I ever knew, he was the one who had most intimate personal sympathy with his patients."



Barlow's conduct of his duties, as well as the part he began to play in the debates of the old Pathological Society of London, made him a marked man. He became assistant physician at Great Ormond Street in 1875, and held the same appointment for a year at Charing Cross and two years at the London Hospital before returning in 1879 to University College Hospital. Already his writings showed a wide range and a turn for the practical. In the *Transactions* of the Pathological and Medico-Chirurgical Societies, and in these columns, he began the publication of notes on fœtal rickets and its diagnosis, and on rheumatism and pleural effusion in children, which established his position as an original pathologist. Nearly 62 years ago, in March, 1883, he read the paper which made his name. In this communication he established that infantile scurvy is identical with scurvy as seen in adults. But he also did more; he was the first to show that rickets is no essential part of the disease—an observation that gradually led to the discontinuance of such terms as acute rickets, hæmorrhagic rickets, and scurvy rickets. W. B. Cheadle in 1879 had recognised the scorbutic nature of these cases, which he called scurvy supervening on rickets; and Barlow—always ready to acknowledge the work of others—repeatedly explained that Cheadle's clinical observations preceded his own description of the pathological anatomy of infantile scurvy to the Medico-Chirurgical Society in 1883.

In his Bradshaw lecture to the Royal College of Physicians in 1894 he carried further his account of the disease known by this time as *die Barlowische Krankheit* or Barlow's disease. The lecture, published in THE LANCET, embellished the clinical picture with several additional touches, including the "sinking backward of the sternum" and proptosis, and laid more stress on the urinary symptoms. It was, besides, a remarkable survey of the whole subject. First recognition of the symptoms was attributed to the Swedish physician Ingerslev, who had suggested in 1873 a scorbutic origin for a case of the kind described on the Continent as acute rickets. This suggestion had been dismissed by the German school, but was supported by Samuel Gee and Cheadle. Barlow himself, by post-mortem examinations, had been able to demonstrate an anatomical substratum for many of the symptoms found, and the lecture began with a review of the main anatomical features of the syndrome whose existence had been deduced 11 years previously. Pathology in every department has made vast progress in theory and in detail since 1894, but no-one can read this Bradshaw lecture without admiring the contemporary learning displayed, and without seeing the permanent value of the lessons drawn. Barlow (and indeed Cheadle before him) fully understood that scurvy was a deficiency disease, and emphasised the preventive and curative value of "living food": "the further we get from a living food," he said, "the less is the antiscorbutic power." It was many years before vitamin C was discovered; but, as we wrote in 1935:

> It has been the rare privilege of Sir Thomas Barlow that he has been able to witness, as a consequence of his work, the complete conquest of the acute manifestation of the disease which he described, and the abolition, not only of death from this cause but also of the intense suffering which preceded it. Moreover, he has seen a significant change in the character of the disease and the birth of a sure and certain hope that infantile scurvy even in its latent form will soon belong only to the past. Such a reward is vouchsafed to few men, and of Sir Thomas Barlow it may be said that none has deserved it more.

Barlow's other contributions to medicine were many. He was greatly interested in rickets, and in conjunction with Judson Bury wrote in Keating's *Cyclopædia of Diseases of Children* (1889) a careful description of the course and morbid anatomy of this disease. He was also interested in rheumatism in children, and at the International Medical Congress in London in 1881 he produced with Francis Warner an important paper "on subcutaneous nodules connected with fibrous structures occurring in children the subjects of rheumatism and chorea." He had been observing such nodules since 1875, when a single case was recorded by a French writer (Meynet). With Warner he was able to tabulate a series of 27 cases, and describe the histology. Two years later he propounded the view, now very generally accepted, that these nodules correspond with the inflammatory exudate on the cardiac valves in endocarditis—a view which gives the nodules a clinical significance hitherto unrecognised, for it makes them an index of recently active rheumatic inflammation which may have affected the heart at the same time. He was also one of the earliest to recognise in infants a form of meningitis different from the "dropsy of the brain" described by Robert Whytt (the tuberculous meningitis of later writers), and also distinct from the secondary meningitis found sometimes with empyema. With Samuel Gee, he contributed to the *St. Bartholomew's Hospital Reports* for 1878 an article "on the cervical opisthotonos of infants," showing that the essential lesion was a basal meningitis, different in appearance from that of tuberculous meningitis. The cause remained a mystery, but the authors came very near the truth when they specially noted the clinical resemblance to epidemic cerebrospinal meningitis, and only rejected the causal association because they could find no evidence of epidemicity in their cases. Sixteen years later Barlow wrote with David Lees in Allbutt's *System of Medicine* on this same disease, whose bateriology had then recently been described. The volume also contains his account of tuberculous meningitis, characteristic in its thoroughness and minute observation, both clinical and pathological. He was elected FRS in 1909 in recognition chiefly of his research into rickets.

It would be a mistake to suppose, however, that Barlow confined himself to pædiatrics. He was a general physician, enjoying as such the confidence of his colleagues, and he was one of those chosen to attend Queen Victoria in what proved to be her last illness. Physician to the Royal Household from 1896 to 1910, and physician-extraordinary to Queen Victoria, King Edward VII, and King George V, he was created a baronet and appointed KCVO, both in 1901. At the Royal College of Physicians of London, of which he was elected fellow in 1880, he served as president from 1910 to 1915. The position of quiet authority that he maintained was manifest when in 1913 he presided over the International Medical Congress held in London. At University College Hospital he held the Holme chair of clinical medicine, and for the University of London he

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did much good work. His honorary degrees included the LLD of Aberdeen, St. Andrews, Durham, Harvard, Montreal, Toronto, and Edinburgh, the D Sc of London and Victoria, and the MD of Christiania and Dublin.

Barlow married, in 1880, Ada Helen Dalmahoy, who died in 1928. They lost a son in the last war. Of the two surviving, Sir Thomas is in the family business of cotton manufacture, and Sir Alan is second secretary to the Treasury; while his daughter has been his companion for many years. As with many men of brilliant mind, his interests were not circumscribed by his profession; he was an informed botanist and geologist and a student of art and music. Of late years, outside his own circle, he was best known to most of us through his presidency of the Royal Medical Benevolent Fund, dating from 1920. The older he became, the more interest he took in enlarging the scope of the Fund's activities, and his personal concern over the difficulties of applicants was remarkable. It was mainly at his suggestion that the Fund began to send at Christmas a small and unexpected gift of money, with a friendly message of remembrance and encouragement, to its poorest beneficiaries. At first a few gifts of a pound were sent to those in the greatest need of help; but these gave such delight, not only in the gifts themselves but in the "being thought of" by strangers, that an effort was made to expand this truly Christmas service. Since 1929 Barlow has addressed every Christmas a personal appeal to the medical profession through the medical press, and the response has been increasingly generous. Born in "the hungry forties," the alleviation of cold and hunger always appealed to him, and it was a constant joy that his efforts were successful.

The vitality that helps some men to rise above their fellows may tend to give them longer life; but the burdens of success make it very rare for a man of such distinction to reach so great an age as Barlow's. The span of his life seems something of a marvel when septuagenarians tell us that when they reached Great Ormond Street as house-physicians he had already retired from the active staff, after 20 years of service. THE LANCET of the week in which he was born contains an informative article by Mr. Prior, deputy inspector of hospitals and fleets, on the legal responsibilities of medical men in attendance upon duels.—Moreover, he lived all his 99 years fully, retaining to the last his penetrating intelligence and much of the remarkable memory that served him so well as a clinician. Though he was happy in his country home near Wendover, he could never be long away from Wimpole Street, where he continued to see a few old patients and could keep in closer touch with the Benevolent Fund.

Those who wish to emulate Sir Thomas Barlow's professional success and unembarrassing longevity may profit by his advice to medical students of University College Hospital in 1928, the last long pronouncement from him that appeared in this journal.

> I can hear you say: "Who is sufficient for these things?" You are all sufficient if you will learn by blunders and chronicle in your own records your mistakes. Be sure to index your notebooks—names of persons if possible, but another section for diseases. Be determined to maintain your own health at the maximum of fitness. Keep Saturday afternoons for athletics and country walks. Burn very little midnight oil. Avoid scratch meals and the doctor's bad habits of bolting food. A cigarette after lunch and dinner has its place, but don't smoke whilst you are working. Take the minimum of alcohol and only with food, and best of all try experiments on yourself of doing without.
>
> Save a little time every day for general reading, the Bible first of all, then Shakespeare, and the great English essayists, poets, and historians, Bacon and Addison, Boswell's *Johnson*. Don't forget Montaigne and Erasmus's *Colloquies*, and Balzac's *Médecin de Campagne*, the most beautiful picture of a country doctor's life. Godlee's *Life of Lister*, one of the best biographies in the English language, will make a special appeal to University College Hospital men. Good music and good drama have their occasional rightful place.
>
> You must cultivate good friendships . . . but keep your links with home firm and constant. Tell your people about every part of your work and play and about your teachers and fellow students.

But assiduity, moderation, and affection do not wholly explain the achievements of this stocky, downright, kindly Lancastrian. He had great gifts and used them greatly.

GEORGE BUCKSTON BROWNE

KT, LL D ABERD., F R C S

Sir Buckston Browne, benefactor of the Royal College of Surgeons and its oldest fellow, died in London on Jan. 19 at the age of 94. Like Sir Thomas Barlow, he was born in Lancashire and trained at University College Hospital. And like Barlow he made his old age fine and constructive.

Born in 1850, he was the only son of Henry Browne, physician to the Manchester Royal Infirmary, whose father, grandfather, and great-grandfather had been medical. He did well both at University College and at the Hospital; he won the Liston gold medal for surgery, and "in 1873, after a three days' competitive examination, two days before the whole school, in operating theatre and mortuary, I was fortunate in winning the house surgeoncy no 1" in which he worked under Sir John Erichsen. His wards, he recalls, had several cases of hospital gangrene; and no wonder, for after amputation the stumps were wrapped in picked oakum, and ligatures were often of raw hemp. "Surgeons and dressers wore old coats often stiff with dried blood, and we washed our hands in a small basin on the ward table." But the surgical registrar was Marcus Beck, a nephew of Lister's; and Lister sent from Scotland his first antiseptic dressings. "Our hands were often sore, and some patients had carbolic acid poisoning, but the immediate results were splendid, and many a compound fracture was saved from amputation."

In 1874, when he became MRCS, Buckston Browne was invited by Sir Henry Thompson, of UCH, to become his private assistant. Thompson had gained a great reputation by his skill in cutting for the stone, and his assistant became his collaborator. In 1884 he began to practise on his own account, and the demand on his services was such that in 27 years, it is said, he took no holidays, his only exercise being a walk of 20 or 30 miles of a Sunday. An obituary in the *Times* recalls that his eminent patients included R. L. Stevenson and George Meredith, who "gratefully inscribed to George Buckston Browne, surgeon," the novel *Lord Ormont and his Araminta*. Though he held no hospital appointments (nor any diploma beyond the MRCS) he achieved success as a urologist, and his immense experience is manifest in his lectures to the Harveian Society in 1901, on Twenty-five Years' Experience of Urinary Surgery in England, published in full in these columns.

In 1909 he gave up practice and began his years of retirement with a journey round the world. But the last war saw the death of his only son, Lieut.-Colonel George Buckston Browne, and by 1926 his wife and his grandson had also died; the only remaining member of his family was his daughter, who had married Sir Hugh Lett. Perhaps for this reason, he devoted himself more and more to schemes for the benefit of the public and the profession. The most important of these was realised at Downe in Kent where in 1927 he purchased the whole of Charles Darwin's estate. The house where Darwin lived and wrote was filled with Darwiniana and committed to the care of the British Association as a national memorial, suitably endowed. In 1931, with a gift of £100,000, he enabled the Royal College of Surgeons to build nearby the surgical research farm which bears his name. The college had conferred its fellowship on him in 1926, and in the following year he endowed the annual dinner at which, before the war, 50 members dined with 50 fellows. On these and other public occasions Buckston Browne, if he spoke at all, always had something interesting to say, and said it in a way that his juniors might envy: soft-spoken and self-effacing, he had in public a clear strong voice, and he said precisely what he intended. The Harveian Society also benefited by the endowment of a dinner and a biennial prize. Other gifts were made to University College Hospital, where he endowed a bed and furnished the senior common-room of the medical school; to St. Stephen's Church at Sparsholt in Hampshire, where his wife was born, and to St. Thomas's School in London. Himself a discerning collector he

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presented works of art to various galleries, museums, and medical bodies. These many benefactions revealed a man who in later days found most happiness in enriching corporate life, alike in small ways and in large. Both his services and his qualities were appreciated. Unofficially he was always a welcome guest, while officially the Royal College of Surgeons made him a trustee of the Hunterian Collection and gave him its gold medal, the University of Aberdeen conferred on him an honorary degree, and the Society of Apothecaries created him an honorary freeman. He was knighted in 1932.

ISABELLA DOUGLAS CAMERON
MD EDIN., MRCOG, DPH

Dr. Isabella Cameron, who died in Edinburgh on Jan. 10, was for 25 years an officer of the Local Government Board and of the Ministry of Health, where she had a large share in developing the maternity and child-welfare services. The daughter of a schoolmaster, she was born at Stanley, in Perthshire, and one of her brothers, J. F. Cameron, is master of Caius College, Cambridge

In 1898 she graduated with distinction at the Medical College for Women, Edinburgh. During her medical course she was already acting as a demonstrator in physiology at the College of Surgeons under Professor Noel-Paton, and her MD thesis on the dietary of students in halls of residence was a companion study to his work on the dietary of the working-classes. After holding resident appointments at the Crichton Royal, Dumfries, and the Children's Hospital, Sheffield, she returned to her old school as lecturer in physiology. She also worked at the laboratory of the Royal College of Physicians of Edinburgh, and her methods of standardising suprarenal preparations was published in the *Proceedings of the Royal Society of Edinburgh*. In 1906 she was appointed medical officer to the Carnegie Dunfermline Trust, then pioneering in the medical examination, treatment, and systematic physical training of school-children. Later, as medical officer to the Edinburgh committee for the training of teachers, she seized the opportunity of generous vacations to study child care in Germany, Canada, and America. In 1914 Dr. Cameron joined the Local Government Board as an assistant inspector, but soon afterwards was seconded to the War Office to act as controller of medical services of the WAAC. She returned to civilian life in 1919 as a medical officer to the new Ministry of Health and was appointed senior medical officer in 1936. Inevitably much of her later writing was fused in official reports. She was responsible for the section on Lancashire in the reports on high maternal mortality published in 1932, and she also took part in the investigation into the same subject published in 1937. In that year the Royal College of Obstetricians and Gynæcologists invited her to become a member. She retired in 1940.

A colleague writes: "Level-headed and balanced in judgment, Dr. Cameron possessed mental gifts not always found in women in the public service. Her acute mind was in some respects cast in a masculine mould. She had in full measure that Scottish caution which sometimes vexes those eager for quick decisions, but her judgment on matters great or small, when formed, carried great weight with those who knew her. Her self-control and reflection were derived from the stoical elements in her nature. Yet her massive common sense was blended with lighter qualities, and in the office—even when in later years 'a senior statesman,' a 'mother in Israel,' and confidant of many in their troubles—she was often among the gayest of an hilarious party. An older member of a large family, she retained to the end a very real interest in children and young people, and she was a true Scot in her love of her clan. She read much, wrote long and admirably entertaining letters, and had a fine literary sense and love of words. She loved natural beauty and especially the Lake District. She lost her home in the London blitz but faced the years that followed with the serenity of spirit with which she had met the trials and disappointments of her professional life."

Another friend says of her: "A woman of strong affections, she had a great gift of inspiring affection, and in a service in which personal criticisms are seldom left unexpressed I never remember hearing her spoken of except with affection and respect. Her generosity and kindness of heart were notable."

Medicine and the Law

Medical Board's Certificate Final

THE High Court decided last December a workmen's compensation case where a county-court judge had disagreed with the certificate of the medical board under the Coal Mining Industry (Pneumoconiosis) Compensation Scheme. Under this scheme, if the medical board certifies that the death or disablement of a workman has been caused by pneumoconiosis, or that, while not totally disabled, he is suffering from the disease to such a degree that it is dangerous for him to continue work in the industry and is for that reason suspended from employment, compensation is to be paid to the workman or his dependants as if the disease were (in the familiar language of the Workmen's Compensation Acts) an injury by accident arising out of and in the course of his employment. In Chedgy *v.* Somerset Collieries Ltd. the workman had been a miner for many years. A year ago the medical board examined him and certified that he was suffering from pneumoconiosis, that, though he was not thereby totally disabled, it was dangerous for him to continue working in the mine, and that they had suspended him from that work accordingly. They certified that the disease was as yet in an early stage and that the degree of physical impairment was moderate. They added a statement that the workman was, however, at present unfit for any work owing to conditions not associated with the disease. When subsequently Chedgy's application came before the county-court judge at Frome as arbitrator, the colliery company pleaded that his condition was due to causes unconnected with pneumoconiosis. There was conflicting medical evidence and ultimately the judge found the workman to be totally incapacitated from pneumoconiosis. The employers then appealed. The scheme declares that the certificate of the medical board issued in pursuance of its provisions is to be conclusive evidence of the matter therein certified; the judge, they argued, had made a finding inconsistent with the medical board's certificate.

The High Court accepted the contention of the appellant colliery company. If the medical board certified Chedgy to be partially incapacitated through pneumoconiosis and totally incapacitated through another cause, it was not for the county-court judge to say that the man was totally incapacitated through pneumoconiosis. The High Court observed that the finality of the medical board's certificate was an essential element in the scheme. The county-court judge had failed to treat it as final.

Presently, we may hope, a system of all-in insurance and rehabilitation will relieve the courts of these disputes about compensation for industrial diseases. Many of them, though perhaps not Chedgy's case, arise from the inherent awkwardness caused by the law's characteristic approach to the problem. Instead of making proper and direct provision for the victims of an industrial disease of gradual development, the legislature has preferred to pretend that the disease is of the nature of a physical injury of sudden onset. In spite of the draftsman's consequential adaptations and modifications, the rights of the parties are enveloped in an atmosphere of make-believe which the Minister of National Insurance must somehow clarify.

Appointments

CONCANON, AUSTIN, MD LPOOL, MRCOG, DPH: asst. gynæcological surgeon to the Prince of Wales's Hospital, Plymouth.
EGLINGTON, DOROTHY, MRCS: temp. asst. MOH and asst. school MO for Norwich.
HOFFA, ELIZABETH, MD WÜRZBURG, LRCPE, DCH: asst. MOH and asst. school MO for Accrington.
PERRY, MARGARET, MB DUBL., DPH: temp. asst. MOH for Ealing.

Bristol Royal Infirmary.—The following appointments to the honorary staff are announced:
EWING, H. J. O, MD LOND., FRCP, physician;
SUTTON, G. E. F., MC, MB, MRCP, physician;
COOKE, R. V., MB BRIST., FRCS, surgeon;
FITZGIBBON, Major M. G., MS, MD LOND., FRCS, surgeon;
JACKMAN, Lieut.-Colonel W. A., MB BRIST., FRCSE, surgeon;
PAUL, Lieut.-Colonel R. G., FRCSE, surgeon;
JAMES, Major J. A., MD LOND., MB BRIST., MRCP, FRCS, ENT surgeon;
SCARFF, G. R., MB EDIN., FRCSE, ENT surgeon.

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Notes and News

University of Oxford

On Dec. 23 the following degrees were conferred:

BM, BCh.—Mary R. Barker, *G. M. Colson, P. B. S. Fowler, *R. G. Howell, A. H. James, *A. A. Jefferson, *D. Leigh, *R. H. Marten, Lewis Parker, A. E. Preston, *Joan F. Scott, R. A. Sladden, *C. J. H. Starey, *R. M. T. Walker-Brash, P. West, and Margaret K. Wilder.

* In absentia.

University of Glasgow

On Jan. 13 the following degrees were awarded:

MD.—Thomas Anderson (with honours); H. W. Bowyer and T. McM. Curran (with commendation); R. D. Campbell.

MB, Ch. B.—A. R. Beaton, J. E. Bennett, Katharine N. Brittain, D. F. Bruce, J. P. G. P. Burnie, A. C. Connell, M. S. Crawford, W. A. Crawford, J. L. Crichton, William Cullen, W. J. A. Dobson, Agnes P. Downie, R. E. Evans, R. C. Forrest, Jack Freedman, Arthur Jamieson, J. L. Kelly, Lewis Kennedy, W. I. Kenyon, G. J. Ker, Robert Lindsay, R. McP. Livingston, Margaret J. MacArthur, J. B. Macmillan, T. P. Magee, S. S. Meighan, Walter Napier, A. J. Nelson, I. A. Porter, G. B. Prentice, Jean A. Purdie, J. T. Weir Robertson, S. J. T. Robertson, Janette C. Russell, Thomas Smart, J. R. Smith, Raymond Smith, Rose K. Smith, I. D. Stewart, J. B. Stirling, F. H. Stone, K. J. Whitelaw, T. C. Douay Whiteside, A. M. Williamson, Alexander Young.

The Brunton prize for the most distinguished graduate in medicine of the year was awarded to J. K. Watt, and the West of Scotland RAMC prize to C. M. Ross.

University of London

Dr. L. S. Penrose has been appointed to the Galton chair of eugenics at University College, and Mr. Claude Rimington, PH D, to the university chair of chemical pathology at University College Hospital medical school.

Since 1939 Dr. Penrose has been attached to the Ontario provincial department of health. He has also held the appointment of physician to the Ontario Hospital, of lecturer in psychiatry in the University of Western Ontario, and of medical statistician for the province. He qualified from St. Thomas's Hospital in 1928 and was awarded the Bristowe medal the following year. He obtained his MD Camb. in 1930 and three years later received the Buckston Browne prize. As research medical officer at the Eastern Counties Institution at Colchester he made a special study of the influence of heredity on disease. His book on *Mental Defect* appeared in 1933 and his clinical and genetic study of the subject as a Medical Research Council report in 1938.

Dr. Rimington, who holds the degrees of Ph D Camb. and B Sc Lond., has been on the staff of the National Institute for Medical Research since 1937. He cooperated with Hamilton Fairley and Foy in investigations into blackwater fever and has also worked on the nature of antihormones. His publications include articles on porphyrinuria and methaemoglobinaemia.

Royal Society of Medicine

On Thursday, Feb. 1, at the section of neurology, there is to be a discussion on acroparæsthesia, when the opening speakers will be Dr. Simon Behrman and Dr. Graham Weddell. On Feb. 2, at the section of otology, at 10.30 AM, Mr. C. S. Hallpike and Mr. T. E. Cawthorne will demonstrate the dilatation of the endolymph system, and Mr. A. J. Wright will read a paper on Menière's disease. On the same day at 2.30 PM, at the section of anæsthetics, there will be a discussion on anæsthetic explosions, and at the same hour at the section of laryngology Mr. E. D. D. Davis, Mr. W. D. Harmer, Mr. Lionel Colledge, Mr. M. Lederman, and Mr. W. L. Harnett will open a discussion on carcinoma of the larynx.

Royal Institution of Great Britain

The Friday evening discourses before Easter will include the following: Prof. F. Wood Jones, FRS, the mammalian toilet (Feb. 16); Prof. David Brunt, SC D, FRS, climate and human comfort (March 9), and Mr. J. Z. Young, the structure, degeneration, and repair of nerve fibres (March 16). These meetings will all begin at 5 PM. On Thursdays, Feb. 1, 8, 15, and 22 at 5.15 PM, Prof. James Gray, SC D, FRS, will speak on locomotory mechanisms in vertebrate animals, and on Tuesdays, March 6, 13, and 20 at the same hour Sir Henry Dale, OM, PRS, will speak on nerve-endings and chemical transmitters.

Society for the Relief of Widows and Orphans of Medical Men

At a meeting held on Jan. 3 with Dr. R. A. Young, the president, in the chair, it was announced that a legacy of £5000 has been received from Dr. C. Reid of Stafford. At Christmas £1100 was distributed in presents, each widow receiving £20. The half-yearly grants paid this month amounted to £1948. Membership is open to any registered medical man who at the time of his election is residing within 20 miles of Charing Cross. Full particulars from the secretary, at 11, Chandos Street, London, W1.

National University of Ireland

The degree of MD has been awarded to Prof. J. F. Cunningham, Dr. J. B. McArevey and Dr. P. T. J. O'Farrell, for published work.

A Gift from Colleagues

The Royal College of Surgeons in Ireland have sent 100 guineas to the fund of the Royal College of Surgeons of England for the restoration of their college.

Biochemical Society

A meeting will be held at the British Postgraduate Medical School, Ducane Road, Hammersmith, W12, on Saturday, Feb. 3, at 11 AM.

Polish Medical Association in the United Kingdom

At 5 PM on Tuesday, Jan. 30, at BMA House, Tavistock Square, London, WC1, Dr. Andrew Topping will speak on the aims of UNRRA in the health field.

Films on Anæsthesia

The films in the Technique of Anæsthesia series (reviewed in *The Lancet*, 1944, ii, 773) are distributed by the Film Centre, 34, Soho Square, London, W1.

British Orthopædic Association

The Sir Robert Jones gold medal for 1944 has been awarded to Mr. F. G. St.Clair Strange for his essay on the major amputation stump in health and disease. This was read at a meeting reported in *The Lancet* of Jan. 6.

Nutrition and Catering

Prof. S. J. Cowell, FRCP, is giving ten lectures on nutritional principles and large-scale catering to the National Society of Caterers to Industry. The lectures take place at the Royal Society of Arts, John Street, Adelphi, London, WC2, on Fridays at 3 PM, and the first was given on Jan. 19.

Argentine Plastic Surgeon

Dr. Dellepiane Rawson, head of the special ward for plastic and restorative surgery at the Hospital Rawson, Buenos Aires, has arrived in this country for a six months' visit arranged by the British Council. He will be working in the Emergency Medical Services plastic surgery unit at Park Prewett Hospital, Basingstoke, with Sir Harold Gillies.

CORRIGENDUM.—In the paper by Manson-Bahr and Muggleton (Jan. 20) the dimensions of the tyroglyphid eggs in the segmenting stage (p. 82, line 29) should be 0·1–0·12 × 0·07 mm.

Births, Marriages, and Deaths

BIRTHS

DIXON.—On Jan. 13, the wife of Dr. G. Joly Dixon, of Grappenhall, Cheshire—a son.

HOLFORD.—On Jan. 11, at Colchester, the wife of Surgeon Lieut.-Commander J. M. Holford, RN—a son.

KIRKHAM.—On Jan. 15, at Oxford, the wife of Captain Ray Kirkham, RAMC—a daughter.

LLOYD.—On Jan. 18, at Burton-on-Trent, the wife of Dr. M. Halden Lloyd—a daughter.

MARRIAGES

DUNN—APPLEBY.—On Jan. 15, at West Tarring, Sussex, James Raymond Dunn, captain RAMC, to Joan Margaret Alethea Appleby, ARRC, TANS.

FIELDSEND—ASTLE.—On Jan. 13, at Thorley, Allan Birtwhistle Fieldsend, MB, captain RAMC, to Betty Sybil Astle, MB.

THURLOW—YATES.—On Dec. 8, at Secunderabad, India, Guy Weldon Thurlow, captain RAMC, to Patricia Yates.

DEATHS

BROWNE.—On Jan. 19, Sir Buckston Browne, LL D ABERD., FRCS.

CHATTERTON.—On Jan. 17, at Highgate, Bernard Robert Chatterton, MD DUBL., FRCSI, lieut.-colonel IMS (retd).

FLOWER.—On Jan. 14, at Paignton, Arthur Frederick Ashbrook Flower, MRCS, aged 75.

GAUVAIN.—On Jan. 19, at Alton, Hants, Sir Henry Gauvain, MD, M CHIR. CAMB., FRCS.

LOUDON.—On Jan. 15, at Hamilton, James Livingstone Loudon, MD GLASG., FRFPS, aged 79.

MAITLAND.—On July 19, at St. Helier, Jersey, C.I., Francis Peake Maitland, LRCPE, formerly of the Southern Rhodesian Medical Service, aged 69.

SMALLWOOD.—On Jan. 15, in London, Edward Smallwood, MD BRUX., MRCS, of West Norwood, SE 27.

RICHARDS.—On Jan. 13, at Coventry, Henry Edward Sutherland Richards, MC, MD RUI, major RAMC, TF (retd).

WOOD.—On Jan. 14, Arthur Thorley Wood, MRCS, aged 84.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

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COMPOUND FRACTURES IN WAR
1944

J. A. MACFARLANE, OBE, M D TORONTO
COLONEL RCAMC; CONSULTING SURGEON, CANADIAN ARMY OVERSEAS

BECAUSE of its specialised structure, bone when infected gives rise to particular problems of treatment, often involving repeated operations over many months, and even years. The investigations made so far into the use of penicillin in the treatment of recurrent bone infection offer some promise of increased safety in such operations, but certainly the drug will not sterilise, except temporarily, a cavity which harbours infected dead bone. There is no panacea for osteomyelitis as a complication of compound fractures.

In civilian practice, where for the most part such fractures are compounded from within, and early operation is undertaken, a good number may be regarded as simple fractures. The communication through the skin may be sealed off by sutures after suitable exploration has been carried out. Many successful series of cases have been reported featuring immediate closure with the added safeguard of a course of the particular sulpha drug in vogue at that time.

Compound fractures sustained in battle are the result of missiles of different size and speed traversing clothing and skin, and usually producing varying degrees of damage to soft tissue as well as the shattering of bone. All the conditions favouring severe infection are present—gross soiling by contaminated clothing and skin, and interference with blood-supply. Such hazards may frequently be too great, and the limb may have to be sacrificed in the early stages in order to save life. When however there is sufficient blood-supply, we are today in a position not only to save the great majority of limbs in which there is a compound fracture but also to ensure that union in reasonable position may be expected without gross infection.

In the early stages of this war many surgeons believed that, with the aid of sulphonamides both locally and generally, it was possible to deal with the soft tissue wounds associated with fracture by immediate suture. This was soon recognised as a fallacy, and early in the desert campaigns strong directives against immediate closure were issued by the consulting surgeons. Not even with the advantages of penicillin is it likely that we shall see the time when this method of treatment can be adopted with safety.

Trueta's teaching of wide exploration, adequate excision, and immobilisation with an open wound reduced the incidence of infection both of soft tissue and bone. In a group of 120 fractures among the Dieppe casualties, the incidence of osteomyelitis following Trueta's method was in the neighbourhood of 12%. In certain fractures, notably of the tibia, where the bone lacks muscular clothing, and in others where large amounts of muscle have been removed, a continuously open wound with a large area of bare bone at its base will almost certainly result in some degree of necrosis and chronic infection. In the more favourable case, granulations quickly grow out from healthy resting muscle and shut off the bone from invasion by organisms ever present in any open wound. Certainly the ideal means of protecting bone from infection is to cover it with muscle and skin. It remains to inquire when that may be possible and at the same time safe; what physical or chemical aids are available; and how they should be applied. When during the course of treatment should a final reduction of the fracture be effected? How much stress should be placed on accurate reduction in relation to successful closure and the prevention of infection? These are the questions that military surgeons have been asking themselves ever since adequate amounts of penicillin have been available to the Army. It seems that we are in the midst of a revolutionary change in the treatment of one of the most difficult groups of injuries that occur in war. Military experience will be carried over into civilian practice, and modified to meet the needs of industrial and road accidents, which present somewhat different problems from the battle casualty.

Much experience has been gained during the last four years in the management of war wounds. Surgeons who, as young men, worked on the same problems during the last war, and are actively engaged in this one in a consultant or advisory capacity, are prone to suggest at times that little has been learned that is new, that the principles of rest and infrequent dressings were applied in the years of 1917 and 1918, that secondary sutures were carried out with success in those days without chemotherapy. Be that as it may, the great majority of military surgeons today have had to reach their present state of knowledge by experience in this war. Youth may always be forgiven for learning by its own experience rather than from tradition and history. The greater mistake would be a failure to recognise that there is no static position; that great achievement and progress towards the ideal should only be a stimulus to further effort.

In the field of compound fractures the aim in each case is (1) to save life, (2) to save the limb, (3) to restore its function, and that with the least possible loss of time and inconvenience. The saving of life sometimes demands the sacrifice of the limb at an early stage because of interference with vascular supply and attendant anaerobic infection. Life-saving measures, otherwise, are directed to the control of hæmorrhage and the replacement of blood loss. Measures for the treatment of shock in the forward areas have certainly never been provided in previous wars or in any army on such a liberal and effective scale as in the British Armies today.

INFECTION

Pathogenic organisms are present in all war wounds. Fortunately, if the body has a reasonable circulation, it has great powers of resistance—if that circulation is functioning without too great a handicap. Such handicaps are (*a*) decreased volume of circulating fluid, (*b*) local interference with circulation due to tension, venous thrombosis, or arterial damage. The first and most important duty of the surgeon, after he has remedied the effect of gross loss of circulating fluid, is to ensure that muscle devoid of blood-supply has been excised; that foreign material which is readily accessible in the wound has been removed; that tension is relieved and the limb is left at rest under the optimum conditions for maintaining an adequate circulation. Sulpha drugs and penicillin undoubtedly play their part, but nothing can relieve the surgeon of these responsibilities. Up to the present at any rate, no therapeutic adjunct will allow him to close the wound and send the patient with safety down the varied routes of evacuation to the hospital where he is to receive his final treatment. Early and adequate initial surgery is the foundation-stone for successful treatment of compound fractures. Penicillin and sulpha drugs doubtless have much to offer in preventing general infection during the time which must elapse between initial and final treatment, but it is too early as yet to determine accurately and judicially their merit relative to good surgery.

FORWARD SURGERY

Compound fractures with severe soft tissue damage are considered as urgent problems for forward surgery in the same category as abdominal wounds. With the present organisation it is possible in most battles of defence and advance to provide early treatment. This is impossible either where troops are cut off temporarily or where the enemy counter-attacks in force and meets with success. It has been amply proved by experience in the last year, both in Italy and in north-west Europe, that on the forward surgeon rests the major responsibility for successful treatment of severe wounds, if these wounds are brought to him within a reasonable time.

Adequate early surgery implies radical and careful exploration, the removal of foreign material that is accessible by such an exploration, and particularly the removal of muscle that is non-viable. It implies the saving of skin. Rarely does skin constitute a danger of infection, and it is a precious adjunct for the later and definitive treatment to be carried out at a general hospital. Adequate early surgery implies safe and efficient immobilisation of both the fracture and the soft tissues.

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Chemotherapy.—Nearly every wounded soldier in the recent campaign has been given a routine course of sulphonamides by mouth, and in most cases the drug has been used locally after wound debridement. Since early in the summer, penicillin has been available in sufficient amounts to allow for its routine use in all compound fractures. Administration is initiated at the time of forward surgery, and continued through the lines of evacuation to the base hospital.

There should be only one dressing of the wound until the patient reaches a hospital where definitive treatment can be effected. (This involves an understanding of the professional policy by the administrative officers responsible for the lines of evacuation.) Ideal conditions for prompt and uninterrupted evacuation may on occasion be impossible because of the tactical situation.

DEFINITIVE SURGERY

With the first report of Florey and Cairns on the use of penicillin in the closure of war wounds, the possibility of a revolutionary change in the treatment of compound fractures became apparent. During last winter, in various Canadian hospitals both in Italy and in England, an effort was made to familiarise clinicians with the general technique of penicillin treatment. Various methods of usage in the closure of wounds were tried. By D-day it was decided to aim at the closure by delayed suture of as many compound fractures as possible. As experience increased the percentage of attempted closures increased. It was evident that, even if success was not attained in all, at least nothing was lost, there was no increased danger to life or limb.

During this past summer, the great majority of compound fractures reached hospitals in England within 6 days of wounding. The need for 24 hours rest was apparent. Usually this was the first occasion on which the patient had the comfort of a bed—up to that time he had lived on a stretcher. Usually the estimation of hæmoglobin indicated the need for whole blood transfusion. It has been noted that the whole post-operative course and success of healing is improved if the hæmoglobin can be brought up to 80% before the definitive surgery is done. Good X rays were made, and with these and the notes made by the forward surgeon the base surgeon planned his final treatment of the fracture and to some degree of the wound. (He cannot complete that plan until the patient is in the theatre, for this is the occasion of the first inspection of the wound itself.) Intramuscular penicillin was continued until the wound was inspected in the theatre, and for a variable period after the definitive treatment.

Following the removal of plaster in fractures of the lower extremity, particularly femurs, skeletal traction was instigated as a preliminary to further treatment. The fractured femur is best treated on an extension table and with Steinmann pin or Kirschner wire through the tibial tuberosity. Extension can be maintained and the entire area of the thigh made available for inspection and treatment. Extension is the most important factor in reduction of the long bones. The nearer to accurate reduction the more easily will the clothing of muscle and soft tissue fall into place without tension.

Pathology.—Although cultures were taken as a routine, the gross appearance of the wound proved to be the most important feature on which to base the decision as to immediate closure, partial or complete. Favourable wounds are those in which (*a*) there has been little skin loss, (*b*) there is little or no œdema of the skin edges or subcutaneous tissue, (*c*) dead muscle has been previously excised completely, and (*d*) the removal of the dressing presents clean bleeding tissue with little exudate. Fascial tags and bits of aponeurosis covering muscle may need removing, because it is not always possible for the forward surgeon to estimate the degree of interference of blood-supply to these structures. If they are left they will result in failure of healing.

In other cases, where a large vessel has been sacrificed, death of muscle follows what seemed to the forward surgeon an adequate operation, and there is foul exudate in the wound. The bacteriological examination in such cases will frequently show anaerobes, but clinically the patient is not suffering from gas-gangrene. These wounds need a careful secondary debridement and a further period of rest and penicillin treatment before suture is undertaken.

Routine cultures have shown a surprising incidence of both pyococci and anaerobes in spite of what seemed to be adequate penicillin therapy. This is easily explained on the basis of a persistence of some tissue which is devoid of blood-supply. It does not however mean that penicillin is ineffective. Rather does it prove that penicillin will "freeze" off this infection from the body; and indeed no malignant anaerobic infection has developed in a case which had adequate and continuous penicillin therapy.

Closure.—The favourable case will allow for apposition of the skin by vertical mattress sutures of some strong material such as 'Deknatol,' silk, or linen. Up to 6 or 8 days it will be unnecessary to undercut the skin because the edges have not become adherent to the underlying tissue. There will nearly always be some œdema of the muscle. Even with the fracture reduced, there may be considerable skin tension due to this œdema and accompanying skin retraction. It has been found that if the limb is carefully splinted after operation what under normal circumstances of wound closure is considerable tension may be justified, provided there is no blanching of the wound edges. No buried sutures are used except a ligature for the occasional vessel. No attempt is made to remove granulations or fibrin in this early stage (3–10 days). The simpler the operative procedure on soft tissue the better.

Drainage.—Only in cases with much dead space has drainage been used and then in a dependent site to allow for seepage of exudate for 48 hours. On the whole, penicillin used locally through tubes has not been regarded favourably. Occasionally it has been used as an irrigation in an attempt to sterilise "dirty wounds." It is felt that in the wound favourable for closure it tends to favour the introduction and growth of coliform organisms. The most troublesome cases are those which develop sinuses due to the so-called non-pathogens.

Staged closure.—Where undue œdema prevents complete closure it can often be completed through a window in the cast if half the wound is sutured and the limb immobilised for a week. Relieving incisions parallel to the wound at a distance of 2–3 in. may facilitate closure of the main wound. Wisely planned skin flaps and shifts are being more and more used to bridge those difficult defects associated with compound fractures of the tibia. It is recognised that the tibia, with so little covering of muscle on its anterior border, is prone to die and thus harbour organisms which are immune to any sort of chemotherapy, if it is left uncovered for more than 7 days. This is also true of other structures, such as the tendons on the dorsum of the hand and foot. Every effort should be made in these areas to cover exposed structures as soon as possible. The principles of plastic surgery concerning the use of free skin-grafts, pedicle grafts, and the shifting of skin generally must be applied by the general surgeon.

TREATMENT OF FRACTURE

The existing wound usually affords sufficient access for an examination of the fracture itself. The necessity for such an examination will depend on many factors—the X-ray evidence of large foreign bodies near the fracture site, the gross displacement of main fragments, the need for manipulation of the fragments into better position, and the general consideration of the wisdom or need for internal fixation. It is a mistake to remove any but the smallest fragments in a shattering fracture of the lower extremity. The fragment may be apparently without blood-supply, but in the early stages of treatment it may be successfully covered and serve as a framework for union. The removal of large fragments, particularly in a lower extremity, will result in a gap which may take months to bridge by bone-grafting. For the most part reduction is not a serious problem, for pull is much lessened by destruction of muscle. Moderate extension, varying degrees of manipulation, and firm fixation and support are the guiding principles.

In certain fractures—such as those at the upper end of the femur, some fractures of the forearm, and fractures into joints—good position cannot be obtained without some form of internal fixation. In an increasing number of cases of this sort there has been no hesitation, under

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what were considered favourable conditions of the wound, to use screws, plates, or stainless steel wire to maintain apposition and alignment. The wounds have been closed completely after those procedures, and the success of closure or the progress of union has not been prejudiced. It is as yet too soon to determine whether such measures will predispose to the formation of sinuses later. The danger is the too free use of screws and plates where they are not needed. Not more than 10% of compound fractures in war surgery should require such mechanical fixation.

Immobilisation.—The most satisfactory method of splintage in the immediate postoperative period is that which gives complete rest and adequate support not only to the fracture but to the wound. Successful healing to a large degree depends on this period of complete rest following suture. Plaster-of-paris is the most useful agent for immobilisation. Windows outlined in the plaster immediately after its application may be removed at 10 days to allow the surgeon to inspect the wound or do a further stage of closure.

There has been much discussion during the past six months in our own surgical community about the virtues and disadvantages of the plaster spica in the treatment of compound fractures of the femur. Those who advocate its use combine it with a certain amount of traction through a tibial tuberosity transfixion pin incorporated in the plaster, with the foot of the bed well raised. It probably fulfils the requirements of complete rest and adequate support of soft tissue more completely than any other type of fixation. It has the limitations attendant on complete fixation of knee and ankle, with the risk of loss of alignment as the soft tissues shrink and the limb falls away from the walls of the splint in the later stages of treatment. However, if early and successful wound healing is a sine qua non of successful treatment of the fracture, there should be no hesitation to adopt plaster fixation in the early stages of the treatment. It may be replaced at the end of 3–4 weeks by balanced traction, without as a rule any prejudice to the ultimate result.

RESULTS

Both in the Italian theatre and in the military hospitals here in England it has been possible to close compound fractures with encouraging success when judged after a two-month period. It is true that final success can only be assured after a much longer period. It is however the present practice to return the major number of compound fractures to Canada as soon as they can reasonably be expected to undertake the journey with safety.

During October, 1944, in an attempt to determine with some accuracy the success of this experiment with delayed closure, Major C. Rapp undertook a survey of compound fractures in Canadian hospitals in England. Only those cases on which accurate notes and follow-up records were available for 8 weeks after operation were included. For the most part the cases were seen individually. At the end of that period success was judged by (1) primary healing, or (2) unquestioned healing of the soft tissues, including fascia, with small skin defects (i.e., bone completely "shut off.") Judged as failures were those in which a sinus transversing the deep fascia persisted, whether or not it reached bone, and of course all those in which there was continued suppuration.

Of 200 cases in which closure was attempted, 160 or 80% were successful. In femurs, of which there were 58, the proportion of successful results was 72·4%. In 51 fractures of the humerus, 88·2%. In 44 fractures of the lower leg, 68%. In 23 fractures of the forearm, 91%. The most disappointing group was the severe fractures involving both bones of the leg. Here out of 14 cases only 7 were successful. The average interval between primary surgery and closure was 7·6 days.

The average amount of penicillin used in each case from primary surgery until completion of therapy was 1,156,000 units, extending over an average of 10·8 days. A little over half these cases received a course of sulpha drugs extending over 6 days with an average dose of 27 grammes. Since this review, several other investigations have been undertaken by the O/Cs of various surgical divisions and their figures tally closely with those given here.

In the Italian theatre,[1] of one group of 103 fractures 92 were closed, 71 being successful, while 11 were not closed and only 2 of these escaped bone infection. This comparison is not a fair one because it is immediately apparent that a certain number of severely infected cases were unfavourable for closing at any time. The figures do indicate however that in 90% of all the cases coming to that particular hospital closure was tried, and with 80% success. In this theatre a slightly higher percentage of fractures are closed with similar success.

DISCUSSION

There is little doubt that the general standard of treatment of compound fractures resulting from the injuries of war has been greatly improved in the past five years. This is borne out not only by a decreasing early mortality from this severe type of injury, but also by a well-marked decrease both in late mortality and in the amputation-rate as the result of sepsis. This saving of life and limb has increased the problems in the late treatment of limb injuries—the bridging of bone gaps, the repair of tendons and nerves, and the fusion of joints. But in the absence of sepsis there is great scope for reconstructive surgery.

We have witnessed in these five years a change from the closed plaster open wound treatment, by which most of the early war wounds were treated, to an era of delayed closure in over 90% of all compound fractures. The direct advantages are evident not only in the saving of life and limb but in the great reduction in hospital days. The problem of the majority of compound fractures becomes merely the treatment of a simple fracture. Instead of the large rigid scars which result from a mass of fibrous tissue in a granulating wound, the scar is soft, pliable, and healthy with a minimum of fibrous tissue. This is a matter of no small importance, particularly in the lower extremity.

There may be a tendency to ascribe increased success and the limitation of sepsis to chemotherapy. There is as yet little evidence that such is a correct assumption. In a recent unpublished report[1] from Italy equal degrees of success in delayed closure were attained in two groups of cases, one receiving prophylactic penicillin, and the other receiving either inadequate amounts or no penicillin therapy. Earlier work in a Canadian hospital carried out in relation to the prophylactic use of sulphonamides in compound fractures showed no appreciable differences in the suppression of infection or the rate of healing. During this entire period there has fortunately been no tendency to replace early and adequate surgery by drug therapy. Indeed, surgeons everywhere have recognised the importance of early surgery and have made provision for taking surgery to the patient by means of mobile surgical and shock teams.

The lessons learnt from Trueta's experience in the Spanish Civil War have meant much. Early and adequate surgery, complete immobilisation and soft-tissue support—these are still the sheet anchor of the forward surgeon. Plaster-of-paris has prevented frequent inspections of the wound during the journey down the lines of evacuation. There is no doubt that this in itself has lessened streptococcal infection.

Penicillin undoubtedly has played its part. It is impossible as yet to say how great is that part in relation to careful surgery. Certainly wounds are now arriving at the base hospitals in much better condition than before its use. Bacteriological investigation often reveals penicillin-sensitive organisms in the wound in spite of a healthy appearance. It is obvious that when given by the intramuscular route penicillin will not destroy organisms in any small bit of tissue devoid of blood-supply, but it probably can isolate such infection and prevent its spread to viable healthy tissues.

Penicillin has been the instrument through which the attention of surgeons has been called to the possibilities of delayed suture. It has given them assurance that, if infection does follow attempts at closure or the mechanical fixation of compound fractures, by judicious administration of this drug the infection will be localised. No longer should either the patient's life or limb be endangered by such procedures. With increasing experience of its use, and variation of method, there is still much to

1. Report by Major John Hamilton, No. 1 Canadian Research unit.

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be learned of its exact value and place in the treatment of all war wounds.

In surveying the generally good results of treatment, including the comparative success of delayed closure, due credit should be given to that enthusiastic band of younger surgeons who have laboured often amidst difficulties and danger to ensure that the first and all-important surgery has been promptly and skilfully done.

DECOMPRESSION FOR CHRONIC PROSTATIC RETENTION

CONTROLLED BY INTRAVESICAL PRESSURE

H. T. COX, MD CAMB., FRCSE
SURGICAL SPECIALIST (FULL-TIME; TEMP.), WITHINGTON HOSPITAL, MANCHESTER MUNICIPAL SERVICE

THE term chronic prostatic retention is used in this paper to include any case with painless but persistent bladder distension to the region of the umbilicus. Chronic prostatic retention should, on clinical grounds, be subdivided into the two main groups into which most cases naturally fall.

The clinical features presented by the first, and by far the larger, group are predominantly urinary—dribbling incontinence together with a large tense bladder usually reaching to or above the umbilicus. This dribbling incontinence is so incapacitating that the patient, unless too senile to be incapacitated, seeks advice early. The clinical history and duration of the bladder distension are therefore characteristically short with a diminished likelihood of secondary intrinsic renal involvement. The presenting symptoms of the second group are more general than local—loss of appetite and weight, vomiting, &c.—the bladder distension being discovered on routine examination. The absence of bladder symptoms in this second group inevitably increases the risk of renal damage because of the long delay between the onset of the bladder distension and its detection.

This paper deals mainly with group 1 retentions. In general terms the thesis is that group 1 retentions are best treated by a rapid decompression with withdrawals of increasing volumes of urine and controlled by the intravesical pressure. The traditional slow decompression has been reserved for group 2 cases.

To exclude the presence of pyelonephritis, which would obviously confuse the relationship between the intravesical pressure and blood-urea, cases with urinary sepsis producing a turbid urine throughout were omitted. Cases that had been catheterised before admission were also omitted for the same reason. The table shows the

RESULTS OBTAINED BY DECOMPRESSION CONTROLLED BY INTRAVESICAL PRESSURE IN 9 CONSECUTIVE CASES OF GROUP 1 RETENTION WITH RAISED BLOOD-UREA FIGURES

In only 1 case, no. 6, did the blood-urea subsequently rise

Case no.	Age (yr.)	Blood-urea (mg. per 100 c.cm.)				Duration of decompression (hr.)	Total urine withdrawn (oz.)
		Before decompression	Days after decompression				
			1st	2nd	3rd		
1	74	283	108	59	36	19½	195
2	84	206	99	63	49	5½	95
3	77	186	45	27	23	5	117
4	59	178	41	45	38	6	128
5	74	160	56	48	—	6½	95
6	62	160	158	—	66	5½	88
7	63	150	62	45	29	6½	64
8	62	84	43	52	46	3½	78
9	73	66	70	49	61	9½	85

results obtained by this controlled decompression in group 1 cases with a raised blood-urea, and, with three exceptions, represents a consecutive series admitted to Withington Hospital in a period of ten months. Of the three patients excluded, two, aged 84 and 70, were admitted moribund with blood-urea readings of 190 mg. and 389 mg. per 100 c.cm., and only one had urinary sepsis with a consistently turbid urine.

INITIAL AND TERMINAL INTRAVESICAL PRESSURE

The first step in the investigation consisted in measuring and comparing the drop in intravesical pressure produced by the withdrawal of urine at the beginning and end of decompression. These results show that at the beginning of decompression in group 1 cases approximately 1 oz. of urine has to be withdrawn to produce a pressure fall of 12 c.cm., while to produce a similar fall at the end approximately 34 oz. have to be withdrawn. From this it is to be expected that greatly increasing volumes of urine will have to be withdrawn during decompression in order to produce a decreasing intravesical pressure throughout. The fallacy of all constant withdrawal methods (e.g., 4 oz. hourly) in group 1 retentions, if their object is to produce a gradually decreasing pressure, is thus revealed.

The average initial intravesical pressure in acute retention was found to be 36 c.cm., in group 1 chronic retention 56 c.cm., and in three cases of group 2 retention 23 c.cm. Group 2 represents the lowest pressure group, and group 1 the highest, acute retention occupying an intermediate position. This difference in pressure has been taken to indicate a failed bladder tone in group 2, consistent with the long history of prostatic obstruction, and an increased tone in group 1, consistent with the shorter history and representing an attempt by the bladder musculature to overcome the obstruction. The bladder therefore shows no exception to the well-known sequence of muscle hypertrophy followed by failed hypertrophy in partially obstructed hollow viscera.

INTRAVESICAL PRESSURE IN RELATION TO DETRUSOR TONE AND RENAL OUTPUT

At the beginning of decompression, with the bladder distension at its greatest, the muscle-fibres are at their maximum stretch; at the end these fibres are at rest. The difference in the volume of urine which must be withdrawn at the beginning and end of decompression to produce a similar fall in pressure is due to differences in muscle tone conferred on the muscle-fibres by differences of stretch. The detrusor tone therefore plays a decisive but gradually diminishing rôle in determining the intravesical pressure throughout decompression.

The withdrawal of 4 oz. of urine produces a drop in pressure. This is followed as a constant normal cystometrogram finding (figs. 1–3) by a variable rise in pressure. This rise may be due to urine entering the bladder from the kidneys, especially when polyuria is marked; it may be due to partial recovery in muscle tone following a diminution in stretch; or it may be due to a combination of these factors. The effect of an irritable hypertrophied bladder alone in producing this pressure rise was demonstrated by a decompression on a case of retention with infected (possibly tuberculous) urine. The withdrawal of 4 oz. lowered the pressure from 40 to 25 c.cm. Within three seconds the pressure had risen to its original figure of 40 c.cm. The rapidity of this rise was such as to exclude urinary influx as its cause.

Using the 4 oz. hourly method as a type, it is clear that a renal output above or below this figure will result in a retardation or acceleration of the rate of decompression. The greater the polyuria and the more marked the muscle tone the less the pretensions of the 4 oz. hourly method to reduce the intravesical pressure.

The fall in pressure on withdrawing 4 oz. of urine is, for equal degrees of bladder distension, much smaller in group 2 cases known to have a failed detrusor tone than in group 1. This difference in pressure fall, together with the difference in initial pressure, provides a solid physiological basis for, and an important means of determining or confirming, the distinction between the two groups. These two factors, variation in detrusor tone and renal output, occurring in varying degrees and association, lie at the root of most of the difficulties encountered in decompression in group 1 cases.

INTRAVESICAL PRESSURE THROUGHOUT DECOMPRESSION (GROUP 1)

The patients were observed for a period before decompression. Two blood-urea readings were taken,

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one at the beginning and one at the end of this period, thus avoiding the false impression often presented by a single reading which cannot convey the idea of a rising or falling value; the urinary output was measured and the clarity or turbidity of the urine noted. A description of instructive cases follows.

CASE-RECORDS

Aged 94. Chronic retention with 4 days' dribbling incontinence.

Period of observation 24 hours; bladder 2 in. above umbilicus, very tense. Urine clear, output 6 oz. Blood-urea 94, rising to 120 mg. per 100 c.cm.

Decompression: Time 2½ days; 2 oz. ½ hourly for 2 hours, then 4 oz. hourly. Blood-urea at commencement 120 mg.; 24 hours after commencement 116 mg., 48 hours after 120 mg., 60 hours after 110 mg. per 100 c.cm. In view of persisting high blood-urea and intravesical pressure, it was decided to empty the bladder suddenly. Decompression was therefore terminated at the end of 2½ days by emptying the bladder, withdrawing 40 oz.; 24 hours after the sudden emptying the blood-urea had fallen from 110 to 57 mg.; 24 hours later the blood-urea was 40 mg. per 100 c.cm.

The cystometrogram revealed three distinct and significant phases.

(1) During the first 4 hours there was a well-marked fall in intravesical pressure from 50 to 20 c.cm. produced by the withdrawal of 20 oz. of urine at the rate of 4 oz. hourly, and associated with an equally well-marked fall in the blood-urea from 120 to 116 mg. per 100 c.cm. The period of observation shows a rising blood-urea, 94–120 mg. The first blood-urea after the commencement of the decompression (116 mg.) should therefore be compared with the computed rise without decompression (perhaps 150 mg.) and not with the actual figure preceding decompression (120 mg.). On this basis the blood-urea of 116 mg. represents, as stated, a substantial fall consistent with the drop in intravesical pressure.

(2) At the end there was a well-marked fall in intravesical pressure from 15 c.cm. to nil, produced by the sudden withdrawal of 40 oz. of urine from the bladder and associated with an equally well-marked drop in the blood-urea from 110 to 57 mg. in 24 hours.

(3) In the intervening 56 hours—practically the whole of the 2½ days' decompression—there was a high intravesical pressure (20–15 c.cm.) and a high blood-urea (116–124–110 mg.) maintained in spite of an hourly withdrawal of 4 oz. The recorded drop in pressure from 20 to 15 c.cm. in 56 hours is far too small to affect the blood-urea and for practical purposes may be ignored. Thus the withdrawal of 224 oz. at the rate of 4 oz. hourly produced no determining fall in the intravesical pressure and therefore no fall in the blood-urea.

Two important generalisations emerge. First, in the absence of a fixed or slowly reversible renal change the intravesical pressures determine and parallel the blood-urea figures, a substantial fall in the former producing a corresponding and rapid fall in the latter. Secondly, the conventional assumption must be put aside that withdrawal of urine at the rate of 4 oz. hourly (or other similar constant-withdrawal methods) produces, in this type of retention, a determining and continuous fall in intravesical pressure. The withdrawal of this amount of urine produces only the outward semblance of a decompression.

The clear conclusion to be drawn from this case is that a more rapid withdrawal than 4 oz. hourly would abolish the long hold-up in the decompression and result in a more rapid fall in the intravesical pressure and the blood-urea. The reason for the constancy of the bladder pressure in spite of the withdrawal of large amounts of urine is to be sought in those two factors already referred to—polyuria and detrusor tone.

Aged 84. (Case 2 in table.) Seven days' dribbling incontinence. Severe œdema both legs, scrotum and penis. No evidence of uræmia. General condition extremely poor.

Period of observation 7 hours. Bladder ½ in. above umbilicus, very tense. Urine clear, output 3 oz. Blood-urea 218 and 206 mg. per 100 c.cm.

Decompression.—In view of the last cystometrogram findings the time was cut down, the decompression being terminated arbitrarily after 5½ hours; 4 oz. hourly for 2 hours, and 4 oz. half-hourly for the remaining 3½ hours. Bladder was then emptied by allowing its contents (55 oz.) to run out through the catheter. The three 24-hour periods after decompression showed a urinary output of 178, 138 and 118 oz.

Pathological report on prostate successfully removed by transurethral prostatectomy: "Anaplastic carcinoma of the prostate." X ray showed: "Secondary deposits in lumbar spine and pelvis."

The pressure at the beginning of decompression was 60 c.cm., at the end of the first hour 46 c.cm. and at the end of the 2nd hour still 46 c.cm.—the beginning of the same hold-up that dominated the last decompression. Furthermore, during the 2nd hour an additional factor was observed to come into play, strong detrusor contractions. These took the form of three major contractions with a pressure rise to 71 c.cm., accompanied by severe vesical pain and numerous painless sustained contractions with a pressure rise up to 59 c.cm. Taking into account these numerous contractions there was clearly a rise in intravesical pressure during the 2nd hour of decompression. In order to induce a drop in pressure the rate of decompression, as already stated, was then doubled by withdrawing 4 oz. half-hourly. The 55 oz. at the end of decompression was withdrawn in amounts of 20 oz. After the first 20 oz. there was a rise in pressure up to 44 c.cm. as the result of a strong detrusor contraction with severe vesical pain. The pressure remained at 40 c.cm. after the second 20 oz. had been withdrawn, then fell to 23 c.cm., at which figure it remained for 2 minutes. These high pressures recorded at the end of decompression are further evidence of an extremely active detrusor tone.

The term "slow decompression" for cases of this type is a misnomer. When the process is slow the decompression is inadequate and when there is an adequate decompression it is not slow. As long as there is an appreciable amount of urine in the bladder the active detrusor tone maintains a high pressure necessitating the withdrawal of large amounts of urine and a rapid decompression. In cases such as this, therefore, with an active renal excretion, the question arises not only whether a slow decompression (a gradual reduction in intravesical pressure) is desirable but whether it is even possible.

The clinical picture of bladder distension above the umbilicus with dribbling incontinence, prostatic obstruction and a blood-urea of 206 mg. per 100 c.cm. suggests serious renal impairment. But in view of the ability of the kidneys to reduce the blood-urea from 206 to 49 mg. in 3 days, this view may well be revised. It is clear that either there was no secondary intrinsic renal change or if such a change existed it was a rapidly reversible one.

The rapidity with which a raised blood-urea returns to normal after a controlled decompression is, within rational limits, a more efficient index of renal function than the height to which it is raised.

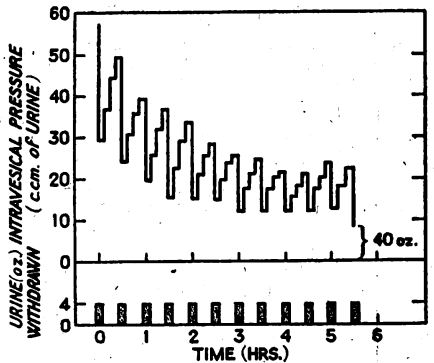

Fig. 1—Group 1 chronic retention. Typical chart with constant-withdrawal decompression—an initial drop in pressure with subsequent flattening out of the curve. Pressure falls induced by withdrawals of urine are well-marked, typical of group 1, and indicate a good detrusor tone.

These rapid decompressions are sometimes followed by a faint bright red hæmaturia. This occurs at a time when the blood-urea is falling rapidly and has not been associated with any deterioration in the patient's general condition. It is in a totally different category from the dark red hæmaturia associated with a rising blood-urea and known to occur in too rapid decompressions in group 2 retentions.

Aged 62 (case 6 in table). Nine months' dribbling incontinence. Severe œdema of both legs for 10 weeks. Blood-urea 160 mg. per 100 c.cm.

Period of observation 24 hours. Urinary output 86 oz. with frequent passage of 3 oz. at a time. Bladder just above umbilicus.

Decompression (fig. 1).—4 oz. half-hourly for 5½ hours, then 40 oz. The chart is typical of a constant-withdrawal

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decompression—an initial drop in pressure followed by a flattening of the curve. Blood-urea fell from 160 to 66 mg. in 3 days. On the 8th and 13th day blood-urea 104 and 98 mg. (first stage transurethral prostatectomy followed by normal micturition); on the 15th, 21st and 29th day blood-urea 102, 85 and 71 mg. (second stage transurethral prostatectomy); on the 50th day blood-urea 48 mg.

In general terms, and apart from any question of intravesical pressure, the measure of the largest amount of urine passed during the period of observation, in this case 3 oz., provides a certain and safe guide for the initial withdrawal in the subsequent decompression. Another case, with the bladder 1 in. above the umbilicus and a blood-urea of 50 mg., passed 10 oz. of urine at one micturition and continued to pass large amounts during the period of observation. His blood-urea had fallen by next day to 37 mg. It is absurd, in this type of case, to insist on the withdrawal of such small initial amounts as 4–5 oz. unless one is willing to admit the equally absurd assumption that the patient's ability as well as his inability to pass urine is maintaining the high blood-urea.

The maintenance for some time after decompression of a high blood-urea (66, 104 and 95 mg.) indicates intrinsic renal damage. The history is the longest of the series—9 months dribbling incontinence—and therefore one most likely to be associated with secondary intrinsic renal damage. Once such renal damage has been produced by excessive duration of the retention, renal sepsis or pre-existing renal disease, to such a degree as to raise the blood-urea, no decompression however ideal can be expected to lower it to normal.

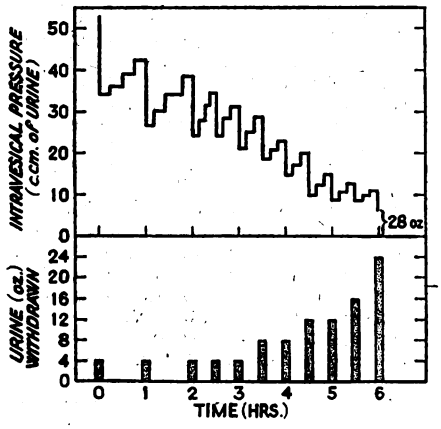

Fig. 2—Group 1 chronic retention. Chart illustrates that increasing volumes of urine must be withdrawn to produce a decreasing pressure throughout decompression.

A "cold-punch" transurethral prostatectomy has been found to play an important part in the treatment of group 1 retentions, since it allows an early restoration of micturition and thus dispenses with the necessity for protracted bladder drainage.

Aged 77 (case 3 in table). Ten days' dribbling incontinence. Bladder 1 in. above umbilicus. Blood-urea 186 mg. per 100 c.cm.

Decompression.—The rise in intravesical pressure after withdrawal of the first 4 oz. was so well marked as to necessitate subsequent withdrawals at half-hourly intervals. This rate had to be doubled to 8 oz. half-hourly to induce a fall in pressure. The intravesical pressure was still at its original figure of 50 c.cm. after 2½ hours' decompression with a withdrawal of 20 oz. of urine. The decompression was terminated at 5 hours by withdrawing 45 oz. of urine. The postdecompression polyuria reached the high figure of 276 oz. in 24 hours.

Aged 59 (case 4 in table). Five days' dribbling incontinence. Bladder at umbilicus. Blood-urea 178 mg. per 100 c.cm.

Decompression (fig. 2).—This was dictated throughout by the intravesical pressure and shows a continuous fall in pressure produced by withdrawals of increasing amounts of urine.

Aged 74 (case 1 in table). Fourteen days' dribbling incontinence. Bladder at umbilicus. Urine clear. Tongue moist and clean. Blood-urea 283 mg. per 100 c.cm.

Decompression (as in fig. 3).—The first distinctive feature in this chart is an absence of pressure rise (30–30 c.cm.) during the second hour. The pressure rise in the third hour was present but uncommonly small (23–26 c.cm.). Succeeding hours showed a gradual increase in pressure rise. The amount of urine (4 oz.) withdrawn being constant, the

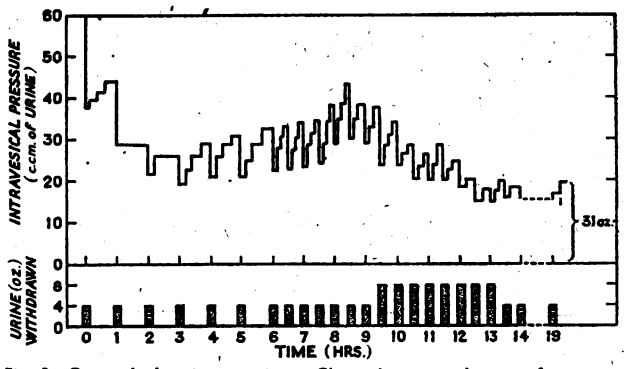

Fig. 3—Group 1 chronic retention. Chart shows an absence of pressure rise during the 2nd hour (taken to indicate a temporary anuria or oliguria), and an inconstant relation between the volume of urine withdrawn and the intravesical pressure. Withdrawal of 4 oz. hourly during the first 3 hours was associated with a falling pressure; withdrawal of 4 oz. hourly and half-hourly from the 4th to the 9th hour was associated with a rising pressure.

diminution or absence of a pressure rise is due either to failure of detrusor tone or to diminished renal output. But since the pressure falls of 60–38 c.cm. and 45–30 c.cm. for the first and second hours are large, and provide evidence of a good detrusor tone, these absent or diminished pressure rises are most rationally to be ascribed to absent or diminished renal output. This is quite consistent with a blood-urea of 283 mg. before decompression, the highest of the series, and one in the region of which renal failure may be expected to occur.

The pressure rise for the 4th, 5th and 6th hours exceeded the fall, thus producing a gradual increase in intravesical pressure. Doubling the rate of emptying to 4 oz. half-hourly did not diminish the rise in pressure, indicating the development of polyuria. The rate was again doubled to 8 oz. half-hourly, causing a definite drop in pressure. In view of the earlier anuria a rapid decompression was considered inadvisable and the decompression was therefore prolonged by cutting down the rate of emptying to 4 oz. half-hourly for a further 7 hours. It will be seen from fig. 3 that the withdrawal of 4 oz. hourly in the first 3 hours produced a falling intravesical pressure, whereas the withdrawal of double this amount subsequently produced a rising pressure. From this it is clear that a decompression that is based solely on amounts of urine withdrawn and not on intravesical pressure may well be misinterpreted and will certainly be misconducted.

The use of the cystometrogram during the same decompression and with the bladder distended had unmasked the existence of an early anuria and a succeeding polyuria. This swing from anuria to polyuria requires an elastic method of decompression with constant changes in the amount of urine withdrawn.

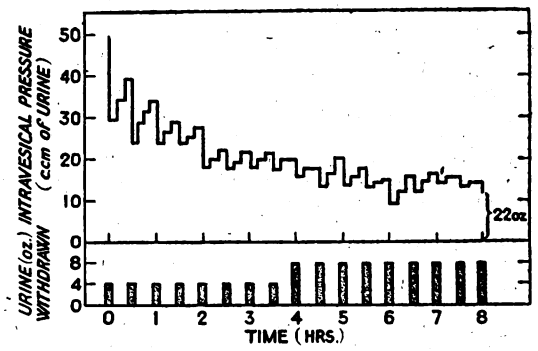

Fig. 4—Mixed chronic retention. Chart shows small pressure falls (with the exception of the first hour) induced by withdrawals of urine, indicating a failure of detrusor tone (group 2). The more definite pressure falls of the first hour are to be ascribed to the recent increase in vesical distension with the onset of group 1 retention.

It should be again emphasised that the cases here presented belong to group 1, had clear urine and had not been catheterised before admission.

MIXED CHRONIC RETENTION

A group 1 retention may be superimposed on a group 2 retention. This mixed type may show a clinical similarity to group 1—recent overflow incontinence with

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a greatly distended bladder. A distinction between the two however is of supreme importance because the mixed type possesses the salient feature of group 2—the probability of long duration of the bladder distension with secondary intrinsic renal change—and should be decompressed slowly.

A preceding history of loss of weight or failure of health should be a warning that the patient probably has an underlying group 2 retention. Small pressure falls induced by withdrawals of urine during decompression would confirm the diagnosis (fig. 4).

CONCLUSIONS

In group 1 chronic retention increasing amounts of urine must be withdrawn to produce a decreasing intravesical pressure throughout decompression. Constant-withdrawal methods are based on what, in this group, does not exist—constant renal output and constant bladder tone.

The high blood-urea figures in group 1 retention characteristically fall rapidly to normal after a correct decompression. A correct decompression, it is suggested, is one in which, in the absence of contra-indications, the withdrawals of urine are so adjusted as to reduce the pressure by approximately 10 c.cm. per hour (fig. 2). Two contra-indications exist—a small pressure fall induced by withdrawals of urine indicating a failed detrusor tone and therefore an underlying group 2 retention, and an absence of pressure rise indicating the presence of anuria or oliguria.

The ability of the kidneys rapidly to reduce the high blood-urea to normal indicates the absence of secondary intrinsic renal involvement.

SUMMARY

The routine decompression of the bladder in chronic urinary retention is a blind procedure without guiding signs. A record of the intravesical pressure converts it into a controllable and intelligible process.

In the group of cases where the symptoms are mainly urinary, renal output and bladder tone vary in different cases and in the same case to such a degree as to render inadequate a fixed planned decompression based on the volume of urine withdrawn. Flexibility of decompression based on the intravesical pressure is essential.

The intravesical pressures were taken with the combined cystometer and tidal irrigator described by Major O. W. Stewart (*Lancet*, 1942, i, 287).

PNEUMOCOCCUS LOBAR PNEUMONIA

RESULTS WITH DIFFERENT BLOOD-LEVELS OF SULPHAPYRIDINE

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IN a previous paper (Dick 1944) on the chemotherapy of pneumococcus lobar pneumonia, I drew attention to the fact that, in Glasgow, type II infections carried a fatality-rate of about 14% when receiving only a sulphonamide drug, and that the addition of an autogenous vaccine failed to improve the results. Plummer and others (1941) have shown that combined chemotherapy and serum therapy was not more beneficial than chemotherapy alone. In view of the relative failure of specific serotherapy to enhance sulphonamide therapy, Anderson (1943) suggested that to improve the results in pneumonia a more intensive course of chemotherapy might be given, particularly to older subjects. Such an argument assumes that the therapeutic effect of the sulphonamides is correlated with their concentration in the blood, and the purpose of the present paper is to investigate the results of chemotherapy in this respect. If a high blood-level is beneficial then surely the time has come when dosage of the sulphonamide drugs must be controlled by a knowledge of the actual blood concentration of the drug.

METHOD

There was no selection of patients—the 161 cases represent a continuous series of patients suffering from pneumococcus pneumonia, irrespective of the type of the infecting pneumococcus, the presence of bacteræmia, or the age of the patient.

The dosage of sulphapyridine employed was 2 g. initially followed by 1 g. every four hours, continued in most till the end of the seventh day in hospital. Specimens of blood were withdrawn for estimation of the concentration of free sulphapyridine at the same time each day (between 1.30 and 2 PM—i.e., about four hours after the previous dose of the drug had been given). The first specimen of blood was obtained on the day after admission to hospital, and further specimens were obtained on subsequent days throughout the period of therapy. The method used for the estimation was that of Bratton and Marshall (1939).

In order to assess the results of therapy in respect of varying blood concentrations, it was decided to use the mean concentration of the drug calculated from estimations performed on the second, third, and fourth days in hospital. It is during the early days of therapy that sulphapyridine is most likely to exert its beneficial effect, especially if bacteræmia is present, so that the mean of the first three estimations of the blood concentration gives a fair estimate of the actual amount of the drug in the blood at the crucial period of the illness.

RESULTS

Table I shows that the majority of patients had a mean blood-level under 6·0 mg. per 100 c.cm.; in only about 20% of patients was the mean blood-level over 6·0 mg. per 100 c.cm. This proportion is less than that reported by other workers (Abernethy et al. 1939, Kinsman et al. 1940). The patients in the present series, however, received an average of 6 pints of fluid per diem, so that lower levels might be expected than in patients whose fluid intake is less.

TABLE I—DISTRIBUTION OF CASES ACCORDING TO MEAN BLOOD-LEVEL OF FREE SULPHAPYRIDINE, OBTAINED WITH STANDARD DOSAGE

Mean blood-level (mg. per 100 c.cm.)	Cases	Percentage of cases	
0– 2·0	17	10·5	78·3
2·1– 4·0	56	34·8	
4·1– 6·0	53	33·0	
6·1– 8·0	28	17·4	21·7
8·1–10·0	6	3·7	
10·1–12·0	1	0·6	

Since the number of cases in each blood-level group is small, it was decided to compare the results of therapy in those whose mean blood-level was under 6·0 mg. per 100 c.cm. with those whose level exceeded this figure. The cases were analysed in respect of temperature response, incidence of complications, and final outcome.

(*a*) *Temperature response.*—Table II shows that among the patients exhibiting pyrexia, a slightly greater percentage whose blood-level exceeded 6·0 mg. per 100 c.cm. had normal temperatures at the end of 48 hours in hospital in comparison with patients whose blood-levels were under this figure. The slight difference is, however,

TABLE II—CLINICAL RESPONSE IN PATIENTS WHO RECOVERED, GAUGED BY TIME TAKEN FOR TEMPERATURE TO RETURN TO NORMAL WHEN MEAN BLOOD-LEVEL WAS UNDER AND OVER 6·0 MG. PER 100 C.CM.

Temperature response	Mean blood-level (mg. per 100 c.cm.)			
	6·0 and under		6·1 and over	
	No.	%	No.	%
Normal in 48 hr. ..	56	*49*	19	*61*
Normal in 96 hr. ..	101	*88*	27	*87*
Normal in 144 hr. ..	103	*90*	28	*90*
No effect *	12	*10*	3	*10*

* Pyrexia exceeding 144 hr.

Note: Five patients whose mean blood-level was under 6·0 mg. per 100 c.cm. were afebrile at the time of admission and were therefore excluded.

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not statistically significant. By the end of 96 and 144 hours in hospital, practically the same percentage had normal temperatures in both blood-level groups. In 10% of patients, even in spite of a high blood concentration, sulphapyridine was ineffective in reducing pyrexia.

(*b*) *Incidence of complications.*—Since delayed resolution is a relatively common complication of pneumonia, it is important to know if the blood concentration of sulphapyridine affected in any way the process of resolution. Table III shows clearly that delayed resolution occurs irrespective of the blood-level of sulphapyridine.

TABLE III—INCIDENCE OF DELAYED RESOLUTION, IN PATIENTS WHO RECOVERED, WHEN MEAN BLOOD-LEVEL WAS UNDER AND OVER 6·0 MG. PER 100 C.CM.

Mean blood-level (mg. per 100 c.cm.)	Cases	(With delayed resolution)	
		No.	%
6·0 and under ..	120	24	*20·0*
6·1 and over ..	31	7	*22·6*

The following mean levels were found in five patients who developed sterile pleural effusion—under 2·0 mg., two cases; 2·1–4·0 mg., one case; 4·1–6·0 mg., two cases. In three cases of empyema, one had a mean level under 2·0 mg., one between 2·1 and 4·0 mg., and one between 4·1 and 6·0 mg.

The number of patients among the 161 cases who developed complications is small, but it is noteworthy that the process of resolution appears to be unaffected by the concentration of sulphapyridine in the blood, and that sterile pleural effusion and empyema may occur in cases with relatively high blood-levels.

(*c*) *Final outcome (recovery or death).*—Table IV shows that an excellent rate of clinical recovery occurs in patients whose mean blood-level is not high. Of the

TABLE IV—NUMBER OF CASES AND DEATHS AND FATALITY-RATE FOR MEAN BLOOD-LEVEL UNDER AND OVER 6·0 MG. PER 100 C.CM.

Mean blood-level (mg. per 100 c.cm.)	Cases	Deaths	Fatality-rate %
6·0 and under ..	126	6	*4·8*
6·1 and over ..	35	4	*11·4*

4 patients in the over 6·0 mg. group who died, 2 were critically ill at the time of admission and recovery was not expected; one of these patients died after 30 hours in hospital. The percentage difference (6·6) between the fatality-rates of the two groups has a standard error of ± 5·7 so that is not statistically significant.

(*d*) *Effect of very low blood-level.*—It is interesting to note that in 17 patients the mean blood-level was less than 2·0 mg. per 100 c.cm. yet all recovered; these cases appear to be worthy of further consideration. Table V

TABLE V—ANALYSIS OF 17 CASES WHOSE MEAN BLOOD-LEVEL DID NOT EXCEED 2·0 MG. PER 100 C.CM.

Type of organism	Cases	With bacteræmia	Age in year		Pulmonary involvement		Days of illness	
			Under 40	Over 40	1 lobe	2 or more lobes	Up to 3rd	After 3rd
I	4	2	3	1	2	2	0	4
II	10	4	7	3	7	3	5	5
III	1	0	0	1	1	0	0	1
IV	2	0	2	0	2	0	2	0
All types	17	6	12	5	12	5	7	10

shows that infections of all types were included among them; 10 had a type II infection. Some were really ill—6 had bacteræmia and 5 were over 40 years of age, these including a man of 72 years with a type I infection having bacteræmia of 3 days' duration, and a man of 71 years with a type III infection. The duration of primary pyrexia was not lengthened by this low blood-level, for in 8 cases it did not exceed 48 hours and in 13 cases it did not exceed 96 hours. The complications encountered among the 17 patients included 2 cases of delayed resolution, 2 of sterile pleural effusion, and one of empyema. The incidence of delayed resolution was no greater than in those with higher blood-levels.

DISCUSSION

The analysis shows that for recovery it is not essential to have a high concentration of the drug in the blood; there were no deaths among 17 patients of varying type infections whose mean blood-level was under 2·0 mg. per 100 c.cm. Moreover, the fatality-rate was little different in those who had a high blood-level than in those whose blood-level was low. The number of cases in the high blood-level group is admittedly small, yet it is suggestive that no correlation could be found between the blood-level and the final outcome of the disease (recovery or death), the duration of primary pyrexia, or the incidence of complications, in particular of delayed resolution.

It thus appears that the sulphonamides can be effective when present in the blood in quite small concentrations. This does not imply that lower dosage of the drugs would safely be adopted. Table I shows that the blood concentration varies considerably with standard dosage. The reason for this variation is not understood; no correlation was found with certain factors of the host (age, sex, and gastric acidity) or of the parasite (type of infecting pneumococcus and presence of bacteræmia). The day of beginning chemotherapy also had no effect on the blood concentration. The fluid intake does influence the concentration of the drug in the blood—patients whose intake is small tend to have high blood-levels, while a large intake is usually associated with a low blood-level—but even with a fairly constant fluid intake the blood concentration varies widely. It appears therefore that some people have a greater capacity to absorb the sulphonamide drugs from the small intestine than others. That being so, a lowering of the usual dosage is obviously not permissible. The results, on the other hand, do not seem to justify a more intensive course of chemotherapy to raise the blood concentration to a high level as a means of reducing further the fatality-rate in pneumococcus lobar pneumonia; there appears to be no need to exceed the usual 2 g. (or 4 g.) initially followed by 1 g. four-hourly.

A study of the blood-concentrations of the drug does not, therefore, reveal the cause of failures in the chemotherapy of pneumococcus pneumonia. Many patients are admitted to hospital at a late stage of the illness (after the third day) at which time chemotherapy is recognised to be less effective. It would appear possible to improve the results, especially in the type II infections prevalent in Glasgow, by earlier admission.

SUMMARY

The continuing high fatality-rate of type II pneumococcal infections in Glasgow (14·4%) suggests the need for improving therapy; a more intensive course of chemotherapy was considered.

The estimation of sulphapyridine blood-levels in 161 patients with pneumococcal lobar pneumonia shows that the results of therapy, as judged by the duration of primary pyrexia, the incidence of complications, and the final outcome of the disease (recovery or death) could not be correlated with the blood concentration of the drug.

A more intensive course of chemotherapy in pneumonia thus does not appear to be justified, and there appears to be no reason for exceeding the recognised dosage of 2 g. initially, followed by 1 g. four-hourly.

I wish to thank Dr. W. M. Elliott, medical superintendent of Ruchill Hospital, for permission to publish these results, and Prof. J. W. McNee and Dr. Thomas Anderson for advice and criticism in the preparation of this paper.

REFERENCES

Abernethy, T. J., Dowling, H. F., Hartman, C. R. (1939) *Ann. intern. Med.* **13**, 1121.
Anderson, T. (1943) *Brit. med. J.* i, 717.
Bratton, A. C., Marshall, E. K. jun. (1939) *J. biol. Chem.* **128**, 537.
Dick, A. (1944) *Lancet*, i, 564.
Kinsman, J. M., Moore, J. W., Harrison, M. M. (1940) *J. Lab. clin. Med.* **25**, 1235.
Plummer, N., Liebmann, J., Soloman, S., Kammerer, W. H., Kalkstein, M., Ensworth, H. K. (1941) *J. Amer. med. Ass.* **116**, 2366.

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HÆMOTHORAX

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BLOOD released from its normal channels behaves according to more or less accepted rules, but in the case of bleeding into the pleural cavity an exception seems to arise. In most hæmothoraces the blood remains liquid and does not appear to have clotted. This phenomenon, which is of the greatest assistance to the therapist, has been the basis of much speculation, and theories have been put forward based on the assumption that clotting has not taken place. However, it is now generally recognised that clotting does occur at ordinary speed, but, owing to the physiomechanics of the chest, the hæmatoma is rapidly defibrinated so that the actual gel form of clot is transposed into shreds of fibrin floating in a pool of liquid blood.

When blood escapes into the pleural cavity from a divided blood-vessel in the chest wall or lung parenchyma the lung retracts to leave a space whose size depends on the quantity of blood and air extruded. The volume of blood that can be accommodated is considerable—up to several pints—and the upset of the balance of the intrathoracic organs, added to actual loss of blood, produces a gross disturbance in the physiomechanics of the chest. Increased pulse- and respiration-rates result, and in the case of sucking wounds the symptoms of mediastinal flutter are added. It will be realised, therefore, that blood which reaches the pleural cavity and cannot escape is subjected to violent agitation almost as soon as it leaves the blood-stream. Any clot that forms has little chance of remaining static and is rapidly broken up and fragmented.

If the chest is opened soon after an injury some idea of the general turmoil may be gained. The impression is of a collapsed lung splashing about in a pool of blood and bounding with each transmitted pulsation of the heart. It is easy to understand how, under such conditions, defibrination will occur. Another point that can be noted is that blood which trickles down from the incision along the inside of the pleura coagulates normally. When the hæmothorax fluid has been removed a small residue of clot or fibrin may be found in the depth of the cavity, but in some instances little solid matter can be identified even on careful inspection.

HÆMOGLOBIN AND FIBRINOGEN CONTENTS

To get some evidence on the behaviour of intrapleural blood, investigations have been made on a number of hæmothoraces.[1] There are too many variable factors for accurate deductions, but some general conclusions can be drawn from the investigations into the hæmoglobin and fibrinogen content of the fluid at operation or on aspiration. The most satisfactory studies were done on some half-dozen cases operated on within a few hours of injury. In these the whole volume of fluid was sucked out and thoroughly mixed before specimens were taken. The hæmoglobin content of the hæmothorax was 30–40%, below that of the circulating blood and the fibrinogen content was virtually nil. The complete evacuation of the chest under direct vision and mixing should dispose of the contention that any deposit of fibrin would carry down with it an undue proportion of red cells. In the example given in the table the volume of fibrin was only 2 oz. in over 3 pints of liquid blood.

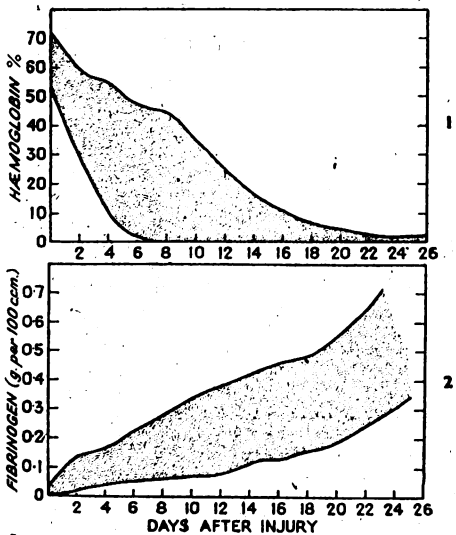

Fig. 1—Hæmoglobin content of fluid aspirated from cases of hæmothorax. Out of 143 readings in 86 cases 88% fell within the shaded area.

Fig. 2—Fibrinogen content of fluid aspirated from cases of hæmothorax. Out of 121 readings in 71 cases 84% fell within the shaded area.

1. No instance of infected hæmothorax has been included, since inflammation would alter the pleural reaction and vitiate the figures. Also no case has been included in which the first two aspirations did not yield at least two pints.

FINDINGS IN VENOUS BLOOD AND PLEURAL FLUID IN A CASE OF HÆMOTHORAX OPERATED ON AND EMPTIED WITHIN 6 HOURS OF INJURY, COMPARED WITH NORMAL BLOOD. VOLUME OF HÆMOTHORAX, 3½ PINTS. VOLUME OF CLOT, 2 OZ.

	Hb%	Proteins (g. per 100 c.cm.)	Fibrinogen
Normal blood	100	6—7·5	0·2—0·45
Venous sample	94	6·4	0·41
Pleural fluid	46*	5·55	0·025

* Small piece of clot contained 180% Hb.

The appreciable reduction in hæmoglobin, even allowing for error, suggests that there was some dilution of the fluid by a reactionary pleural exudate. Since blood can act as an irritant to serous membranes the effusion is not unexpected. The size of this effusion may be considerable, so that the total volume of the hæmothorax is much increased. This effusion probably produces its greatest effect about the third day and may give rise to signs and symptoms of intrathoracic tension with respiratory distress and mediastinal displacement. This is sometimes interpreted as due to further active hæmorrhage and makes the clinician chary of removing more than a small proportion of the total fluid—only enough for relief of symptoms is removed. Many hæmothoraces have not been properly evacuated for fear of starting bleeding again. This is a groundless fear, as recent experience has shown, and the delay in effective emptying of the pleural cavity can only postpone resolution.

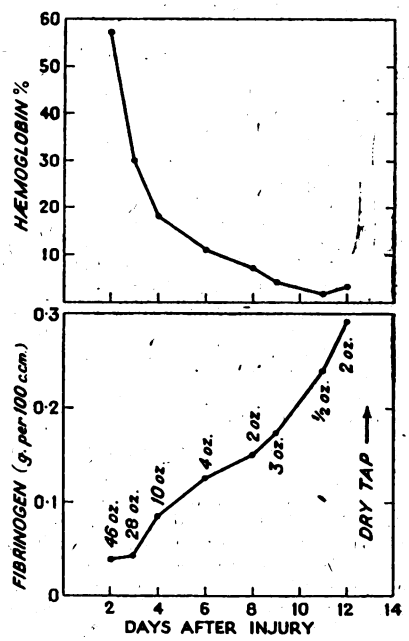

Fig. 3—Details of aspirations and hæmoglobin and fibrinogen estimations in a case of hæmothorax.

That hæmothorax blood is diluted by effusion is shown by the progressive fall in hæmoglobin percentages on successive aspirations (fig. 1). It will be noted that even after the first one or two aspirations the fluid withdrawn registers a surprisingly low percentage of hæmoglobin. The appearance of the fluid is admittedly deceptive since 5–10% hæmoglobin can look like a heavily blood-stained fluid, and even a trace of blood-pigment gives a colour comparable with that of claret or port. It is instructive to keep specimens from each aspiration and compare them in a strong light, when differences in colour and translucency may become apparent.

In a properly treated case the fifth or sixth aspiration sees the pleural cavity practically dry, the last two specimens showing only a trace of hæmoglobin. Most of the cases subjected to routine aspiration were dry by the 11th–14th day (fig. 3), and if continuity of treatment could be guaranteed from the start dryness might be

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expected a few days earlier. However, in war casualties delays in transport preclude uniformity of control. In the present series there were few readings between the 2nd and 5th day because of this delay; some cases were seen quickly after the injury, but others did not reach a chest centre for some days.

The behaviour of the fibrinogen content of the hæmothorax is illustrated in figs. 2 and 3. It will be seen that from virtual absence in the early stages, the percentage rises until in some cases it is higher than the blood-level after a week or so. No accurate interpretation can be based on these limited observations, but it may be inferred that an active serous exudate is produced. The conversion of the aspirated fluid from a "sol" to "gel" may be observed in some of the later specimens, while it is not seen in the early aspirations or otherwise when the fibrinogen content is low.

The significance of an exudate lies in the fact that a considerable quantity of fibrin may be deposited on the walls of the hæmothorax cavity. The process is progressive and it is found that the parietal pleura becomes lined by a much thicker layer (up to an inch) than the visceral surfaces (average about $\frac{1}{8}$ in.). The essence of recovery from a hæmothorax is that the lung should reach the chest wall and obliterate any pleural cavity at the earliest moment. If fibrin develops before the pleural layers become apposed the closure is mechanically delayed. Once the fibrin layer has organised over the lung, it acts as a constricting barrier to expansion and encourages persistence of the dead-space. In addition the chances of infection are increased. If a hæmothorax is well and promptly treated fibrin layers do not have time to develop to any extent, but where evacuation is incomplete, or where excessive effusions occur, the risk of a fibrothorax is considerable. This means that even if infection is avoided the full re-expansion of lung is delayed and full respiratory function is not recovered. That is the inevitable state of affairs in hæmothoraces of appreciable size which are treated conservatively.

Penicillin used intrapleurally appears in some cases to have an irritant effect, and fibrinogen figures occasionally reach higher levels than usual when penicillin has been employed. Estimation of penicillin in aspirated fluid suggests that (using an intrapleural dose of 20,000 units) it is absorbed from the pleural surfaces within 24–36 hours. This applies to early cases where there is no appreciable fibrin deposit; an encysted fibrous pleural pocket may, however, retain active penicillin for a week or more.

CLOTTED HÆMOTHORAX

It has been assumed that blood in a hæmothorax always becomes liquid, but there are occasions on which definite clotting is observed. Massive clotting is comparatively rare, but forms in which substantial clot lies at the bottom of the fluid are more common. In the absence of infection the reason is probably a simple physical one. If blood is very slowly extruded into the pleural cavity there is little reason for much mechanical agitation within the thorax; as a result defibrination does not occur and the ordinary form of clot persists. This is most likely when there are pleural adhesions which help to limit the extent of the hæmorrhage.

The importance of this type of hæmothorax lies in the difficulties that arise in the course of treatment. The aspirating needle fails to yield more than a few c.cm. of fluid at a time before clot or fibrin obstructs the lumen. The same applies to any form of hæmothorax in which there are flakes of fibrin floating in the fluid mass, and a false interpretation must not be placed on what appears to be a "dry-tap." Strictly it is only to the very early cases of coagulation that the term "clotted hæmothorax" should be applied; the form of clotting that appears later is correctly designated by Nicholson and his co-workers as a hæmofibrothorax, and it is important to realise that the effect is produced far more by clotting of the reactionary exudate than by the coagulation of the original blood. Masses of fibrin stained with blood pigment lie in a cavity lined with steadily increasing layers of fibrous tissue. Evacuation of the debris through a small thoracotomy incision is the correct procedure in many cases, and to this decortication occasionally may be added. This latter operation involves removal of the encasing fibrous layer off the underlying lung. The plane of dissection is found surprisingly easily in most instances, and the lung once freed from its restricting influence shows ready signs of re-expansion. Considerable claims have been made for this procedure recently, but in my experience the benefits derived from it are limited.

CONCLUSIONS

Observations have been made on the changes that result from blood accumulating in the pleural cavity.

The blood may reach a volume of several pints and in the free pleural sac this clots normally, but is rapidly defibrinated. A liquid mass is formed in which fibrin shreds may be deposited. Fairly quickly a serous effusion develops and it is this effusion that accounts for the main deposit of fibrin that complicates the later picture.

Apart from the risk of infection, the sooner the original hæmothorax can be evacuated the better will be the chances of functional recovery.

Clotted hæmothorax is relatively rare, but coagulation of an effusion of high fibrinogen content gives rise to the clotted fibrothorax found in a proportion of cases.

It is in the presence of a clot—blood or fibrin—that active surgery may be required. A small thoracotomy allows the cavity to be cleaned and in selected cases permits removal of the restricting layer of fibrous tissue over the lung.

Breathing exercises are of great value in re-establishing full expansion of the collapsed lung.

DETERMINATION OF PLASMA MEPACRINE

A NOTE ON THE ANTICOAGULANT

FROM THE ARMY MALARIA RESEARCH UNIT

SEVERAL methods have recently been published for the determination of mepacrine in plasma (Brodie and Udenfriend 1943, Masen 1943). These authors recommend the use of "oxalate" as an anticoagulant, but it has now been found that if ammonium oxalate, or any salt mixture containing ammonia (e.g., Wintrobe's salt mixture) is used as the anticoagulant the amount of mepacrine found in the plasma is greatly increased.

The mean plasma mepacrine concentration of the patients from each of three hospitals has been determined by a modification of the method of Masen (1943). The table gives the mean plasma mepacrine concentration

PLASMA MEPACRINE OF PATIENTS AFTER TAKING 1·6 G. MEPACRINE IN 48 HOURS

	No. of patients	Mean plasma mepacrine (μg/l)	SE mean
Hospital A	72	84	± 5
Hospital B	6	96	± 19
Hospital C	16	245	± 17
Experimental group ..	6	81	± 9
Hospital C (after changing oxalate)	4	88	± 10

at the end of 48 hours' therapy—i.e., after 1·6 g. mepacrine. It is seen that there was no significant difference between the mean plasma levels of the patients of hospitals A and B, and that neither differed significantly from that of an experimental group of medical students and research-workers who had been given the same dosage under controlled conditions. The mean plasma level of patients from hospital C was, however, nearly three times as great. The difference was maintained throughout the whole of the therapy course. Wintrobe's salt mixture was used as the anticoagulant at hospital C. On changing the anticoagulant to potassium oxalate similar figures were obtained from this hospital also.

In-vitro experiments have shown that the increase in plasma mepacrine concentration was due to the ammonia in the Wintrobe salt mixture. The ammonia presumably displaces mepacrine from the white blood-cells which have a high concentration of the drug (Brodie and Udenfriend 1943). It has also been shown that if

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sodium citrate or heparin is used as the anticoagulant, the concentration of mepacrine in the plasma is the same as with potassium oxalate.

Conclusions and summary.—If the anticoagulant used contains ammonia, the concentration of mepacrine in the plasma from subjects receiving the drug is much greater than that observed when the plasma is prepared with anticoagulants not containing it. Therefore ammonium oxalate, or any salt mixture containing ammonia (e.g., Wintrobe's salt mixture), must not be used as an anticoagulant in the preparation of the plasma for mepacrine determinations. Potassium oxalate, sodium citrate, or heparin are satisfactory anticoagulants.

REFERENCES

Brodie, B. B., Udenfriend, S. (1943) *J. biol. Chem.* **151**, 299.
Masen, J. M. (1943) *Ibid*, **148**, 529.

ASPIRIN POISONING

REPORT OF A CASE

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THE recent account of a case of aspirin poisoning by Charters (1944) prompts me to add a further case to the records.

CASE-HISTORY

A single woman, aged 31, walked into the casualty department of St. John's Hospital, Lewisham, at 1 PM on June 15, 1943, having taken 250 five-grain tablets of aspirin 3 hours before. She had had one attack of vomiting after the first 10–12 tablets, but she had retained the rest. She was sweating profusely, feeling hot, dizzy, and anxious, and much afraid of collapsing in the street. Gastric lavage with 3 pints of weak sodium bicarbonate solution confirmed her statement for the returned fluid contained innumerable fragments of aspirin. A small amount of altered blood was present. This might have been expected since even therapeutic doses may cause hæmatemesis (Hurst and Lintott 1939). Her temperature was 97° F; pulse-rate 140, volume poor; respirations 30 per minute. No mental disturbance. The cardiovascular and respiratory systems showed no abnormality. For 2 hours there was little change, though she vomited a small quantity of bloodstained fluid. During the next few hours her pulse-rate varied from 120 to 140, and she became stuporose, incontinent of fæces, and delirious. She sweated profusely, and her pupils became dilated. Her temperature fell to 96·2° F. There was a little albumin in the urine. Morphine, gr. ¼, was given for restlessness, but with little effect. At 7·15 PM an intravenous drip of normal glucose-saline was started. She gradually settled down, and after a pint of glucose-saline had been given the delirium abated, and she became moderately reasonable. By 11 PM she was sleeping, though easily roused and able to answer simple questions. Still sweating. Pulse-rate 110, temperature 98° F, respirations 30. During the next three days she had auditory and visual hallucinations, and complained of headache, tinnitus, and some deafness. Urine: albumin present; specific gravity 1030–1034; ferric chloride indicated the presence of salicylates.

On June 24, when she was normal apart from some anxiety, she was transferred to the Kent County Council Hospital, Farnborough; Dr. Felix Brown, who saw her there, reported that she was a woman of long-standing depressive personality who had always led a very sheltered life with her mother, and had never been able to adjust well to any change. She had been contemplating suicide for a few weeks, after a forced change of job. After 15 days there she was discharged, and returned to her old job, where she has remained well.

COMMENT

The onset of more severe toxic signs was delayed for some 9 hours in this case. Charters gives 14 hours as the latent period in his own case and in those of Neale (1936) and Biddle (1938). The excessively large dose probably accounts for the shorter delay in my case. The subnormal temperature may be accounted for by the profuse sweating. A rise in temperature was reported by Charters (1944), Neale (1936), and Dyke (1935).

Though drowsiness is common, hallucinations and delusions are unusual. Again the large dose was probably responsible.

Recovery after a dose of gr. 1250 of aspirin must be rare, though Evans (1938) has reported a recovery after 1500 grains. The actual lethal dose of aspirin has not yet been defined. McNally (1937) states that deaths from overdosage of aspirin are rare. Of Balaz's 752 cases of aspirin poisoning in Budapest in 1923–31, only 4 died (see *Lancet* 1931); he estimated the average minimum lethal dose as gr. 450–600. Oakley and Donnell (1942) consider that recovery from more than gr. 500 is uncertain. Table I, however, shows that there

TABLE I—PUBLISHED CASES OF ASPIRIN POISONING

Observer	Cases seen	Aspirin (gr.)	Result
Dysart, 1933	1	5	Died
Williams and Panting, 1937	1	30	Recovered †
,, ,,	1	60	Recovered †
Wyllie, 1935	1	?	Died
Lewis, 1919	1	90	Died
Dyke, 1935	1	435	Recovered
Balaz, 1931	748	Av. 300–450	748 recovered
,, ,,	4	Av. 450–600	4 died
Neale, 1936	1	500	Recovered
Biddle, 1938	1	500	Died
Janovichie, 1935	5	Av. 500	5 died
Lipetz, 1934	1	600	Recovered *
Neale, 1936	1	750	Died
Charters, 1944	1	750	Recovered
Oakley and Donnell, 1942	1	950	Recovered
Neale, 1936	2	1000	2 died
Hitch, 1928	1	1000	Died
Hopkins, 1945	1	1250	Recovered
Evans, 1938	1	1500	Recovered

* No treatment needed. † Children.

have been deaths from far less than gr. 450, and survivals after far greater doses than gr. 600. The outcome probably turns on the person's susceptibility. Table II

TABLE II—DEATHS IN ENGLAND AND WALES FROM ASPIRIN POISONING, OVER 5 YEARS: total, 272

Year	Suicides		Accidents		Undetermined	
	M.	F.	M.	F.	M.	F.
1938	18	25	3	5	5	9
1939	13	23	2	5	3	1
1940*	14	32	5	7	..	..
1941*	15	30	6	6	..	..
1942*	8	27	5	5	..	..

* Figures for these years relate to civilians only.

shows the numbers of deaths from aspirin poisoning in England and Wales in the 5 years 1938–42, as recorded by the Registrar-General (personal communication). In estimating the risk it should be borne in mind, as Lynch (1939) has pointed out, that aspirin is used more commonly than any other drug.

Treatment of this case with gastric lavage and intravenous glucose-saline seems to have been fully adequate. Resort to lumbar punctures, as described by Dyke and Neale, was not necessary; nor was there need for insulin, as used by Charters.

SUMMARY

A case of aspirin poisoning, with recovery after taking gr. 1250, is recorded.

Recorded cases are analysed.

The Registrar-General's figures for 1938–42 show that aspirin poisoning is the cause of some 50 deaths annually.

I would like to thank Dr. Felix Brown for his report on the mental aspect of the case; and Dr. P. F. Ashton, under whose care the patient was admitted, for permission to publish this record.

REFERENCES

Biddle, E. (1938) *Brit. med. J.* i, 1365.
Charters, A. D. (1944) *Ibid*, i, 10.
Dyke, S. C. (1935) *Lancet*, ii, 613.
Dysart, B. R. (1933) *J. Amer. med. Ass.* **101**, 446.
Evans, G. S. W. (1938) *Brit. med. J.* ii, 386.
Hitch, F. G. (1928) *J. RN med. Serv.* **14**, 295.
Hurst, A., Lintott, G. A. M. (1939) *Guy's Hosp. Rep.* **89**, 173.
LANCET (1931) editorial, i, 34.
Lewis, F. W. (1919) *Lancet*, i, 64.
Lipetz, S. (1934) *Brit. med. J.* i, 652.
Lynch, R. (1939) in British Encyclopædia of Medical Practice, London, vol. XII, p. 77.
McNally, W. (1937) Toxicology, Chicago, p. 819.
Neale, A. V. (1936) *Brit. med. J.* i, 109.
Oakley, W., Donnell, J. P. (1942) *Ibid*, i, 787.
Williams, S. W., Panting, K. M. (1937) *Ibid*, i, 550.
Wylie, A. M. (1935) *Lancet*, ii, 768.

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TREATMENT OF BURNS WITH PARTIAL SKIN DESTRUCTION

AN ILLUSTRATIVE CASE

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THE essential factor determining how a burn will heal is the presence or absence of destruction of the dermis. If the surface epithelium only is destroyed, without injury to the dermis, rapid epithelialisation from the epithelial follicular and glandular structures of the dermis should be the rule, provided that septic and other complications are avoided. But if the dermis is destroyed, then its hair follicles and skin glands are destroyed too, so that spontaneous epithelialisation can only occur from the periphery.

English plastic surgeons (McIndoe 1940) have from early in the war emphasised that the key to the treatment of these more severe cases is the earliest possible replacement of the destroyed skin by grafted skin. In cases in which the diagnosis of complete destruction of the skin is clear, primary excision and grafting results in the quickest healing, a procedure which modern chemotherapy has rendered feasible. More usually however grafting is not done until some weeks after the original burn, when the necrosed dermis has spontaneously separated and there is a healthy granulating surface. One of the principal reasons for this is the difficulty of recognising dermal destruction in the early stages. Recently methods have been suggested to aid such recognition. We have suggested the use of van Gieson's stain (picro-fuchsin) as an application to the raw area left after the removal of the blistered epithelium (Patey and Scarff 1944). The raw dermis without coagulation necrosis stains predominantly red, but with increasing amounts of necrosis it stains increasingly yellow. Dingwall (1943) has suggested for the same purpose intravenous injection of fluorescein and examination for fluorescence under ultraviolet light. Along some such lines as these it seems likely that a more accurate recognition in the early stages of the depth of skin destruction will be possible.

But it is an undue simplification to think of burns with skin destruction as falling into the two main types only: those with surface epithelial destruction without dermal damage re-epithelialising rapidly and uneventfully; and those with dermal destruction including the dermal epithelial structures in which skin grafting will be required. There are all degrees of coagulation necrosis of the dermis in burns. In a burn with only superficial necrosis of the dermis, the follicular and glandular structures are all present and capable of re-epithelialising the raw area. They cannot do so however until the superficial layer of coagulation necrosis has been cast off, a slow process accompanied by inflammatory and subsequent fibrotic changes in the dermis. The problem presented by this type of case has not been clearly posed. We are here reporting such a case which we have recently studied and which illustrates some of the points discussed above.

CASE-HISTORY

On July 27, 1944, a baker's roundsman, aged 41, was admitted to hospital with burns of the left hand and buttock sustained 2 days previously, when he fell asleep in bed with a cigarette in his mouth and woke up with the clothes on fire. On admission to hospital, the patient was anæsthetised and the burns examined under operation conditions. Most of the blistered skin had been removed the previous day when he had been treated as an outpatient in the casualty department. There were raw areas of exposed dermis covering most of the fingers of the left hand, particularly the backs, and to a slight degree the hand itself. Over the left buttock there was a similar raw area roughly circular in outline and approximately 7 inches in diameter. After they had been cleaned, both areas were swabbed with van Gieson's solution. The burnt areas of the hand stained red. The periphery of the burnt area of the buttock stained red, but the centre showed a light yellow tinge. The burn of the hand and the periphery of the burn of the buttock were therefore regarded as having sustained surface epithelial destruction only. The centre of the burn of the buttock was regarded as having sustained in addition superficial coagulation necrosis of the dermis. The burnt areas were insufflated with sulphathiazole-proflavine powder and covered with 'Vaseline' net, gauze, and wool. Subsequently a course of 'Sulphamezathine' (32 g.) was given by mouth.

The postoperative course was uneventful, and the first change of dressing was carried out under anæsthesia at the end of a week. The fingers and hand had almost completely epithelialised. The buttock wound had epithelialised at the periphery over a circular zone 1–1½ in. wide. The central portion was not epithelialised; œdematous epithelial islets could be seen regularly arranged in this area; between these the dermis was covered by a superficial layer of adherent slough. The area was treated by hypochlorite and subsequently by saline compresses, and the sloughs slowly disappeared, and were replaced by granulations; as this took place, the epithelial islets lost their œdema and the epithelium could be seen growing out from around them. By 4 weeks after the burn, the buttock showed the peripheral zone of primary re-epithelialisation thickened and approximating in appearance to the normal skin, while the central zone showed follicular epithelial islets still separated by granulations. By 5 weeks, most of the islets had joined and there were only a few areas of granulations. By 6 weeks, epithelialisation was complete.

DISCUSSION

This case illustrated a number of points in the diagnosis and healing of burns. The method of differential staining which we have suggested for the recognition clinically of coagulation necrosis of the dermis proved of value, and the diagnosis made in the primary stage of the depth of destruction in both the hand and the buttock was proved correct by the subsequent course.

We have previously pointed out that the older conception of a plane of separation in the deeper layers of the epidermis leaving the interpapillary epithelial downgrowths (rete pegs) intact has no foundation in fact. The number and appearance of the epithelial islets in this case gives illustration of this point. They numbered approximately 80 to the square inch and their distribution corresponded very closely with that of the hair follicles in the surrounding healthy skin; the order of frequency of the rete pegs of course runs into many thousands to the square inch. Moreover, the re-epithelialising area had a characteristic goose-skin appearance, probably due partly to the œdema of the follicles and partly to contraction of the erector pilæ muscles.

Finally, this case poses the problem of the treatment of the burn with superficial necrosis of the dermis, but with the follicular and glandular epithelial structures of the dermis substantially intact. In a case of this type, all the factors for primary re-epithelialisation in situ are present, but epithelialisation cannot take place until the necrosed layers of dermis have separated. This is a slow process, taking in the present case 6 weeks. During this time, chronic inflammatory and fibrotic changes are taking place in the dermis, so that, when eventually healing is complete, the skin is left thicker and less supple than normal, and more likely to break down. The question arises whether in a case of this type the correct course, with modern chemotherapy and skin-grafting technique, is not to sacrifice the dermis, even though it contains the epithelial elements for regeneration, and to replace it by a skin-graft. By such means, in a favourable case, healing should be complete in a fortnight rather than 6 weeks, and the quality of the healing should be an improvement on natural healing.

CONCLUSION

Consideration of this case takes one step further the problem of the treatment of burns in cases with superficial dermal necrosis only. Even if it is shown that the burnt area is capable of re-epithelialisation from the deeper portions of the hair follicles left intact, expectant treatment is not necessarily the best, since immediate debridement and skin-grafting may give a better result in a shorter time.

REFERENCES

Dingwall, J. A. (1943) *Ann. Surg.* **118**, 437.
McIndoe, A. H. (1940) *Proc. R. Soc. Med.* **34**, 56.
Patey, D. H., Scarff, R. W. (1944) *Brit. J. Surg.* **32**, 32.

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TRAUMATIC ANURIA IN A MINER

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DURING the heavy air-raids on London in the autumn of 1940, crush injury associated with impairment of renal function was described in England for the first time by Bywaters and Beall (1941). We have found only one reference to the occurrence of the condition in the mining industry; the following case of traumatic anuria in an underground worker on the Kolar Gold Field is therefore worth recording.

CASE-HISTORY

A Hindu man, aged 35, was buried for 7 hours (11.30 AM to 6.30 PM) on Nov. 8, 1943, as the result of a rock-burst underground. Broken rock was resting on his head and body, and lagging poles transmitting the pressure of the overlying rock lay across the left buttock and leg. When he was first seen, about 1½ hours after rescue, his pulse was almost imperceptible at the wrist but the blood-pressure was 120/75 mm. Hg. He was fully conscious and complained of inability to move the left leg. The muscles of the leg below the knee and the lower third of the quadriceps were swollen, hard, and tense. There was a superficial abrasion 1 in. in diameter over the middle of the left shin, and immediately above the left greater trochanter was an irregular area about 3 in. in diameter which resembled a second degree burn. In addition there were numerous abrasions over the back, minor lacerations of the right elbow and scalp, and a severe contusion of the left chest. All movements of the left leg were very weak and painful, but the only muscles completely paralysed were those in the anterior tibial compartment. The left foot was cold, but not more so than the right, and pulsation in the left dorsalis pedis and posterior tibial arteries could not be felt. Morphine gr. ¼ was given and continuous drip intravenous saline started (no plasma was available). The condition was recognised as crush syndrome and alkalisation was immediately instituted, sodium bicarbonate gr. 30 and sodium citrate gr. 30 being given four-hourly by mouth. This was continued until the man's death on the seventh day. Local treatment consisted of elevation and cradling of the left leg. The course of the disease is summarised below.

SUMMARY OF PROGRESS

Date	Blood-urea (mg. per 100 c.cm.)	Blood-pressure (mm. Hg)	Hb (%)	Red cells (mill per c.mm.)	Fluid intake by mouth (oz.)	Intravenous saline (oz.)	Urinary output (oz.)
Nov. 9*	93	125/80	110	5·4	60	120	8 (B & S)
„ 10	188	120/85	..	..	100	120	Nil
„ 11	255	..	..	..	160	60	5 (B & S)
„ 12	315	130/90	60	4·2	60	..	½ (clear)
„ 13	396	136/84	..	..	100	..	7 (clear) †
„ 14	444	150/95	..	..	100	..	Nil
„ 15	570	..	..	..	40	..	Nil

* At 11 AM. † 2 oz. in bed. B & S = Black and smoky.

1st day (Nov. 9).—No improvement in general condition noted in the morning. Fully conscious and complained of pain in left leg, thigh, and buttock. T 98° F, P 80 per min. Pulse volume poor. Muscles of left leg, thigh, and buttock more swollen. Both femoral arteries pulsating but only right dorsalis pedis artery could be felt. Despite this, the left foot was warmer to the touch than the right. Vomiting became troublesome during the afternoon and fluids by mouth were restricted. At 6 PM, 8 oz. of "black" smoky urine was passed. Urine was highly acid and contained albumin (heavy cloud), a fair number of red cells, and granular and a few pigmented casts.

2nd day (Nov. 10).—Swelling of left leg, thigh, and buttock increased. Mentally alert and general condition slightly improved. No further vomiting.

3rd day (Nov. 11).—Patient drowsy, tongue dry and furred, but took fluids well; intravenous saline therefore stopped. Left leg and buttock more swollen and skin tense. Left leg still warmer to touch than right. T 99° F, P 90 per min.

4th day (Nov. 12).—Drowsiness unchanged. Picked at bed-clothes. Whole of left leg from groin to toes œdematous with pitting and tenderness on pressure. Left leg warmer than right.

5th day (Nov. 13).—General condition unchanged. Œdema spread to lumbar region. Left dorsalis pedis artery felt for first time.

6th day (Nov. 14).—Very drowsy. Œdema extended upwards to shoulders. No urine passed.

7th day (Nov. 15).—Anuria persisted. At 1.30 PM, after taking 6 oz. of rice water, complained of inability to breathe. Became restless and sweated profusely. One hour later said he was dying and died within 5 minutes.

Autopsy findings.—Permission was given to remove both kidneys and a small piece of the left gastrocnemius muscle only. The *kidneys* were enlarged and swollen and the capsule thin and tense. Medulla engorged, with very clear differentiation between cortex and medulla. Microscopically the glomeruli on the whole appeared normal except for some red cells in the capsular space. The convoluted tubules showed cloudy swelling (in places amounting to necrosis) and desquamation. The collecting tubules and a few of the convoluted tubules contained brown pigmented material, either completely filling the lumen or arranged in ribbon-like fashion. A few of the casts showed polymorph infiltration. There were numerous small interstitial hæmorrhages.

The small piece of *muscle* removed was deeply congested and microscopically showed numerous hæmorrhages between the muscle-fibres. There was no evidence of muscle necrosis.

DISCUSSION

This case illustrates many of the typical clinical and pathological features of traumatic anuria described in detail by Bywaters (1942, 1944). In previous communications the crushed limb is usually described as being cold and pale. The increased warmth of the affected leg in our case points to arteriolar dilatation. It persisted throughout the illness (even when the dorsalis pedis artery was impalpable) and was confirmed by competent independent observers. Unfortunately no information can be given concerning changes in the colour of the skin, as minor variations are impossible to see in dark-skinned people.

It is at first sight surprising that traumatic anuria remained unrecognised in miners until the condition was described in air-raid casualties, for the clinical aspects are striking and there have been numerous accident cases in which underground workers have been buried for long periods by falls of stone. We have been able to trace only one reference to the condition in miners (McClelland 1941), although we have been informed privately of cases occurring in English coal-mines. During eight years' experience in the treatment of accidents in underground workers we cannot recall a previous case of renal failure associated with limb injury. Nevertheless, it is our belief that owing to the rarity of the condition it has been missed. Its infrequency can perhaps be attributed to the type of accident causing prolonged burial. As far as the Kolar Gold Field mines are concerned, such accidents (which are in themselves rare) are usually caused by rock-bursts resulting in the collapse of a level, and the men, working in a confined space, sustain multiple injuries by the fall of masses of rock. Under these circumstances it is extremely unlikely for a man to escape with nothing more than limb compression. In addition, rescue work is difficult and in deep mines the men are trapped in hot oppressive atmospheres. As a result, men buried for long periods, and not killed outright, become profoundly shocked and are either dead when rescued or die immediately afterwards. The accident in which our patient was involved was unusual in that timber supports prevented the main mass of rock from causing more severe injuries.

SUMMARY

A case of traumatic anuria occurring in a miner as a result of an underground accident is described. The condition is rare in miners because their accidents are unlikely to cause limb-compression only, but it is

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probable that cases are being missed. Only one case in a miner has previously been described.

We acknowledge our thanks to Messrs. John Taylor and Sons, managers of the Kolar Gold Field, for permission to publish this paper.

REFERENCES

Bywaters, E. G. L. (1942) *Brit. med. J.* ii, 643; (1944) *J. Amer. med. Ass.* **124**, 1103.
— Beall, D. (1941) *Brit. med. J.* i, 427.
McClelland, J. C. (1941) *Canad. med. Ass. J.* **45**, 332.

COLD AGGLUTINATION IN TROPICAL EOSINOPHILIA

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BESIDES the usual isoagglutinins that distinguish the four blood-groups, there exist in many normal sera substances which cause clumping of red cells in the cold, and are therefore called cold agglutinins. In normal sera the reaction disappears above a dilution of 1 in 10, but in at least three diseases frequent high-titre values are obtained—namely, atypical pneumonia, trypanosomiasis, and paroxysmal hæmoglobinuria. After reading Turner's[1] article on the relation of cold agglutination to atypical pneumonia, we decided to carry out the same investigation in cases of tropical eosinophilia.

Sixty-six cases of tropical eosinophilia have come under our observation so far. We tested 105 sera for cold agglutination, of which 61 were from the cases of tropical eosinophilia; 53 out of the 61 sera gave positive cold agglutination, the titre varying from 1 in 16 to 1 in 2048; 27 of them gave high-titre values above 1 in 256. The significance of this consistently positive finding in tropical eosinophilia is still a matter for speculation, since the ætiology of the condition is still unknown. The pulmonary lesion, though miliary in nature, and the positive cold agglutination, suggest an ætiological similarity between this disease and atypical virus pneumonia.

The technique adopted for testing cold agglutination is given below and the results obtained are shown in the table.

COLD AGGLUTINATION RESULTS

Disease	Sera tested	Positive titres from 1/16 to 1/2048	Strong positive titres above 1 in 256
Tropical eosinophilia ..	61	53 (87%)	27 (44%)
Atypical pneumonia ..	5	4 (90%)	3 (60%)
Other diseases	39	13 (33%)	3 (77·4%)

Technique.—A 2–3% suspension of washed group O human corpuscles is made up in physiological saline. The test serum is diluted with saline in series from 1 in 4 to 1 in 2048, using Felix tubes and a home-made bulb pipette holding approximately 0·4 c.cm. With a Dreyer's pipette one drop of the red-cell suspension is placed in each tube. The contents are mixed by shaking the rack, which is then placed in the ice-chest (temperature about 8° C). Readings are taken the next morning soon after taking the rack from the ice-chest. The lower dilutions will show the cells bound together like a membrane and difficult to disintegrate. The higher dilutions will show fine but definite granules with slight clearing of the surrounding fluid. As the cells would have sedimented overnight the test-tube is flicked twice with the finger before the reading is taken. The tube showing visible granules to the naked eye is taken as the end-point and the dilution of the serum is its titre.

1. Turner, J. C., Nisnewitz, S., Jackson, E. B., Berney, R. *Lancet*, 1943, i, 765.

ROYAL SANITARY INSTITUTE.—At a meeting to be held at the institute, 90, Buckingham Palace Road, London, SW1, on Wednesday, Feb. 14, at 2.30 PM, Mr. T. Bedford, D SC, and Dr. J. Greenwood Wilson will speak on the ventilation of dwellings.

Reviews of Books

Diseases of the Endocrine Glands

(2nd English edition.) HERMANN ZONDEK, MD BERLIN. Translated by CARL PRAUSNITZ, MD BRESLAU. (Arnold. Pp. 496. 40*s*.)

THERE are few parts of endocrinology which have not yet benefited from the researches of Professor Zondek, whose textbook has been republished after an interval of nine years—time for the first English edition to become out of date. It is welcome not only because it is an adequate expression of great learning combined with accurate observation, but because throughout it emphasises the essential unity of endocrinology with general medicine. Implicit in almost every page is the teaching that no man can be a competent endocrinologist who is not a general physician, and that a general physician who knows little or nothing of recent research in endocrinology is a doctor in blinkers. Treatment of the subject is a little unequal—a weakness almost inevitable when one man attempts to cover so wide a subject. In the chapter on pluriglandular syndromes Professor Zondek's great capacity for synthetic thought seems to desert him, and the chapter on disorders of the generative system is sketchy and incomplete. The illustrations, numerous and well reproduced, sometimes seem hardly related to their legends; and the differential diagnosis of Simmonds's disease is not made clear. These defects, though not entirely negligible, weigh little against the value of the whole book.

The Modern Prison System in India

Lieut.-Colonel F. A. BARKER, CIE, MD CAMB., IMS retd, formerly inspector-general of prisons CP and Punjab. (Macmillan. Pp. 139. 10*s*. 6*d*.)

THE Indian Penal Code regulates under a uniform system of legal principles the lives of millions of people, living in communities with widely differing cultures and social structure. Colonel Barker describes the difficulties facing those responsible for giving effect to the ideas and principles which underlie the Code. His experience extended over thirty years of practical administration in the jails department, and the book indicates his broad and human outlook on the reformative aspects of the prison system and the aftercare of prisoners. Conditions differ in the various provinces of British India and in the Indian States; and of late years there have been difficulties associated with overcrowded prisons and political agitation. The high standard of health maintained in Indian jails may be attributed to preventive measures, including not only the destruction of flies, mosquitoes, and rats, but mass treatment of hookworm, inoculation against smallpox and cholera, and provision of a pure water-supply and a balanced dietary. Half the Indian prisoners increase in weight during their stay in prison; but though this speaks well for the food, labour, and medical care provided for them, it reflects adversely on the living conditions of the average Indian household.

Convictions for murder are numerous in India. In the United Provinces in 1938, with a population of about 49½ millions, there were 1135 murders; in England and Wales, with a population of about 40 millions, the annual average is less than 140. There are probably many undiscovered murders, too, for in India men and women leave their homes in search of work and are not heard of again, a dead body does not last long in the jungle and jungles are common, and many poisonings pass as deaths from natural causes.

No doubt much work will have to be done before the penal system in many parts of the British Commonwealth reaches a decent standard. The problems cannot be met without a thorough study of the social background, and for such a study of India the present volume affords a valuable introduction.

Operative Procedure

Published by Johnson and Johnson (Catgut Manufacturers, England).

THIS book contains a series of illustrations in line, which depict surgical technique. The subjects have been carefully selected and beautifully drawn, so that the book forms a miniature atlas of operative surgery.

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THE LANCET

LONDON: SATURDAY, FEBRUARY 3, 1945

Gunshot Wounds of Bone

THE surgery of this war is good. The figures for deaths, for amputations, for abdominal injuries, for gas-gangrene, for healing of wounds and union of fractures, and for return to duty, are better than they have been in any previous war. The reasons are to be found in the accessories of surgery rather than in the surgery itself. Surgical principles have remained unaltered, and surgical skill has advanced little; but surgical methods have developed to a remarkable extent between the two wars, and it is to these technical advances that the improvement must in large measure be attributed. The mortality of abdominal wounds in France is now not much more than half what it was in the last war, but this happy state is less the result of the excellent work of the field surgical units than of the smooth transport, expert resuscitation, forward hospital facilities which air-cover has made possible, intravenous therapy, and gastric suction. Nevertheless, in war, where the surgical services are good and are well administered, it is circumstances rather than methods that govern results. In other theatres of war, where changing circumstances approximate the conditions of warfare to those of 1918, the abdominal mortality is much on the 1918 level. Flesh wounds today are being closed by delayed primary suture with 90–95% success, and this achievement has been credited to penicillin and the sulphonamides; but in 1917, before the discovery of either, many surgeons in the BEF could report series of wounds closed by delayed primary suture with 90% success, suggesting that stable lines, early forward surgery, smooth transport, and well-equipped base hospitals are the decisive factors.

The early closure of compound fractures due to gunshot wounds is, however, something new, and something which before the advent of penicillin would never have been undertaken in the numbers and with the safety that are now recorded from many sources among the Allied armies. It is true that in the history of the last war several series are mentioned in which wounds complicated by fractures had been closed, but it cannot be claimed that the safety achieved or the success reported were sufficient to recommend the policy for wide adoption. Today, where military circumstances permit, closure by some form of suture or skin cover of all war fractures is coming to be regarded as one of the main objectives of the surgical services of an army. Gunshot fractures form the largest and most important problem in war surgery. They provide the great majority of the long-term cases—those who occupy hospital beds for long periods in the theatre of operations and call for large supplies of dressings; those who must be sent home and need trains, planes, and ships to send them there; those who require long aftercare; those who finally are unfit for service. They account for most of those who are permanently disabled to a greater or lesser extent, who remain pensioners and come into hospital again from time to time for further treatment. Successful early closure of gunshot wounds of the bones, by converting an open and contaminated fracture into a closed and uninfected one, will prevent complications and allow earlier, more certain, and stronger union. An open wound, however few and however innocuous the bacteria it may contain, however carefully it may be supervised, invites and in the end almost inevitably suffers invasion of pyogenic cocci. A fracture in communication with such a wound, though it may be uninfected in the early stages, almost invariably becomes colonised by any organisms that enter the more superficial parts. On the other hand, a wound closed by epithelialisation, whether the skin cover be provided by graft or by suture, though it may at first contain organisms, will soon sterilise itself by the action of the healthy tissue. A fractured limb with a healed scar becomes a relatively simple problem, and can be treated with a view to obtaining correct length and alignment and early union, without any modification of method dictated by the care of the wound. Large fragments, that in a septic wound would become sequestra, in a sterile one become chief grafts and accelerate union. Earlier union means earlier functional use and more useful ultimate function.

The proviso, "where military circumstances permit," is a necessary one; for, as MACFARLANE points out on another page, the closure of compound fractures in war demands adequate and early forward surgery, smooth and rapid transit to a holding hospital with no interference during the journey, and a planned routine whose every detail must be supervised by the surgeons responsible for suture. Where the fighting is heavy and continuous, where lines of communication are long and difficult, and during an advance or retreat, these conditions may be hard to fulfil. Adequate early surgery MACFARLANE defines as radical and careful exploration of the wound, removal of foreign material that is accessible by such an exploration, and excision of muscle that is not viable. Skin beyond the more bruised edges of the wound must never be removed, for it will be needed in closure; but it should be incised freely to allow an adequate exposure of the track. The wound and the fracture must be efficiently immobilised for transport, and this is effected in most cases by some form of plaster-of-paris splint, which has the additional merit of discouraging inspection during the journey. All wise surgeons are agreed that curiosity gives cocci their opportunity. Smooth transport of the casualties to a well-equipped general hospital where they can remain till their fractures are united is the second requisite. In Italy, where the possibilities of suture were first explored on a large scale, most casualties reach the base within 3–6 days. In the European theatre of operations, where a sea crossing is involved, the journey may take on the average a day or two longer, but the great majority of patients are in the hands of the surgeon who will see them through the later stages of treatment within a week.

The dressing applied at the primary operation should not be disturbed until it is removed under full aseptic precautions in the operating-theatre as a preliminary stage in closure. It is therefore essential that the surgeon should assess the patient and his wound as far as may be done without direct inspection. A study of the case-notes will indicate whether

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debridement was complete. Radiography through the plaster is always advisable, to indicate the kind of fracture that has to be dealt with, and to show whether there are any metallic fragments still to be removed; for it has been shown that foreign bodies near the fracture site are incompatible with smooth healing of a sutured wound. The blood-picture is investigated, and the patient is transfused with whole blood if his hæmoglobin is below 80%. Any but life-saving operations on the travel-weary should be avoided, and the 24 hours' rest which this assessment enforces is good in every way. In the operating-theatre the plaster is removed and the wound inspected with full surgical ritual. Bacteriological cultures are taken, but the decision to close is made on the appearance of the wound. It has been shown repeatedly that if the primary treatment has been thorough, and if the wound on exposure has clean bleeding surfaces, suture may be safely undertaken. Danger signs are the presence of gas or of pus in deep pockets, and œdema of the skin or surrounding parts.

The operation of closure is conducted on the simplest lines. Projecting tags of muscle or tendon that do not appear to be viable may be trimmed off with scissors, but as far as possible the wound surface is left alone. The skin edges may be freed from their bed with a blunt instrument, but are not undercut if this can be avoided. They are brought together by a series of vertical mattress stitches of some unabsorbable suture material. No buried sutures are used, but deep parts of the wound may be approximated by inserting a few figure-of-eight stitches among those that close the skin. There is usually a certain amount of tension in a wound thus sutured at the end of a week, even though little skin is missing. Where tension is due to traumatic œdema of the underlying muscles it will subside rapidly with closure and immobilisation, and the wound three or four days later will have lost its stretched appearance. Experience has shown that quite considerable tension, as long as the skin is not blanched, will do no harm except in wounds of the leg. Where the skin cannot be approximated by any means, or where closure leads to "tentage"—a roof of skin stretched over an underlying space—two-stage closure or skin flaps may be employed. The wound may be closed except for a few inches where the tension is greatest, and the site marked on the plaster case, so that it can be exposed after a week by cutting a window over it; if the remaining gap cannot then be closed by suture, which it usually can, it may be covered by a graft. Two-stage closure is applicable to wounds where the greatest skin defect does not overlie the bone. If such a step would leave the fracture side exposed, it is preferable to provide cover by the simplest available method of skin transference, as by releasing incisions which are immediately grafted, or by swinging a flap from one side. The last device is particularly applicable to fractures of subcutaneous bones. After closure, the fracture is treated secundum artem, usually by plaster-of-paris or skeletal traction. British surgeons in Italy and Canadian surgeons in the European theatre are freely using internal fixation for the fracture site. Their late results will be awaited with interest. The use of screws, wires, or plates, if it proves to be harmless, will undoubtedly make it easier to obtain anatomical alignment and to secure early joint movement; but the more conservative may wonder whether the addition of a foreign body to the difficulties with which lacerated and contaminated tissues have to deal is not asking too much of the natural powers of resistance. FURLONG'S [1] figures for Italy, in which the femurs of the penicillin series, many of which were plated, showed a higher incidence of chronic sinuses than the non-penicillin series, none of which were plated, lend some support to this cautious attitude.

The results quoted by MACFARLANE from the wards of a group of Canadian hospitals in Britain are typical of those now being reported by many groups using similar but not identical methods and relying on penicillin as a safeguard against systemic infection. In the Canadian series of 200 compound fractures, 80% were successful; success implying either complete healing, or healing of the soft parts with a small skin defect, at the end of 8 weeks. As might be expected, the proportion of successful sutures varies with the bone: it is highest in the arm and forearm, intermediate in the femur where 72% were successful, and lowest in the leg. The leg has always been the surgeon's bugbear. Its skin has little subcutaneous fat and fits too tightly to allow any slack; for surgical purposes its fascia is dense and unyielding; its circulation has all the disadvantages of being at the periphery; its soft parts in the lower third are almost unrelieved tendon; and its main bone is subcutaneous throughout. That the Canadian surgeons are able to report 68% success in 44 sutured fractures of the bones of the leg is therefore all the more striking.

An Industrial Health Service

PROFESSION and public are wakening to the importance of industrial medicine, and many organisations and individuals are engaged in planning the industrial health services of the future. The latest plan comes from a committee of the Royal College of Physicians.[2] Its remark that these services should be planned "in a bold manner without much regard for traditional arrangements" will evoke wry comment from some of the people who have been working on the subject for many years without much encouragement: they may say that the traditions of industrial medicine, like those of royal colleges, are by no means always disadvantageous. But the committee's plan, if not the last word, is certainly a valuable basis for discussion.

An industrial health service, it believes, should be planned as part of the national health service, and closely associated with it at all levels—central, regional, and local. It should be national in its scope and apply to every variety of employment. It should be staffed by medical inspectors, consultants in industrial medicine, and whole-time and part-time medical officers, together with the non-medical personnel, all of whom should be trained for their particular work. In administration the service must be linked not only with the national health service but with university departments of industrial health, where such exist. Perhaps the most important recommendation is that clinical facilities, including hospital beds,

1. Furlong, R., Clark, J. M. P. *Brit. J. Surg.* 1944, 32, 147.
2. Second interim report of the Social and Preventive Medicine Committee of the Royal College of Physicians of London. The members are Dr. A. A. Moncrieff (chairman), Lord Moran, Prof. M. Greenwood, FRS, Prof. A. W. M. Ellis, Dr. H. E. A. Boldero, Dr. J. A. Charles, Dr. P. M. D'Arcy Hart, Dr. Aubrey Lewis, Dr. Janet Vaughan, Sir Allen Daley, Dr. J. E. Gordon, and Prof. J. M. Mackintosh.

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should be provided for the consultants and research-workers in industrial medicine. The aims of the service should include the establishment and maintenance of the best possible environment for work; the prevention of disease and accidents in industry; the reabling of the injured worker; and the education of the workers in health. Finally encouragement should be given to research, both by the service and by the industries themselves.

The committee presupposes that the national health service, with which the industrial health services are to be coördinated, will be built on central, regional, and local organisations. It suggests that ultimate responsibility for the industrial service should be vested in the Minister of Health, and that the chief medical officer of the Ministry of Health should also be chief medical officer of the industrial health service. Surprisingly, it adds that administration should be delegated mainly to the Ministry of Labour and National Service, but for special purposes might still be carried out within the general framework of the service by such bodies as the Ministry of Fuel and Power, the Ministry of War Transport, and the General Post Office. On the face of it, this arrangement seems likely to lead to interdepartmental strife and to defeat the aim of coördination of the national health services; it would surely be much more satisfactory to place all the civilian health services in the country under a single Ministry. No doubt contact would be facilitated if the Ministries of Labour and Health had the same chief medical officer, and the suggestion is interesting; but the sharing of CMO by the Ministries of Health and Education is not completely comparable, and it is by no means customary for officials of one Ministry to be controlled by those of another.

In considering the best arrangements, the question arises whether practitioners of what one may call local-authority public health are the proper people to control industrial public health, which needs a different approach. Industrial health, which involves inspection of individual factories, is all the better for being divorced from local politics and influence; and a tenable objection to control by the Ministry of Health, *née* Local Government Board, is that this Ministry is built on a local-authority basis. It is of course true that the local-authority public health services have been more developed than the industrial health services. COLLIS [3] in his Milroy lectures of 1915, after describing the brilliant investigations in the 1860's of GREENHOW into the effect of occupational dusts on the lungs, says:

> "Why work so well started was then allowed to lie dormant for so long, while other aspects of public health were being strenuously developed by medical officers of health with inspectors of nuisances appointed for every town and district, reinforced now by a battalion of tuberculosis officers, is astonishing."

Much could be written about the reasons for this unequal growth of the two branches of preventive medicine, and probably the term "vested interests" would find a place in the discussion. But the industrial health services have been slowly but surely developing since the appointment of Sir THOMAS LEGGE as the first medical inspector of factories in 1898. At the Home Office LEGGE laid the foundations soundly and well, and the structure he built cannot be lightly demolished. Especially as regards administration, the Royal College of Physicians committee has tackled a difficult problem, and its report might have taken a different turn if more of its members had been industrial doctors and more than one of the interested Ministries had been represented. One of its purposes, however, will be served if critics will now state their alternative solutions.

3. Collis, E. L. *Public Health*, 1919.

Hæmothorax

BLOOD in the pleural cavity is one of the commonplaces of war-time surgery. The amount lost in this way can be considerable, and a bigger internal hæmorrhage can be concealed in the pleura than in any other part of the human frame without necessarily causing death. In the treatment of hæmothorax there is one piece of good fortune that simplifies surgical treatment—the fact that it remains largely fluid, and therefore can be removed through a needle without great difficulty for the surgeon or great inconvenience to the patient. The reason for the fluidity of the blood has long been a subject for speculation. It is now being suggested that it does not arise from failure of the blood to clot when it is poured out into a serous-lined cavity, but rather that coagulation takes place normally and the rapid movements of heart and lung defibrinate the blood. SELLORS points out in this issue that hæmothorax blood a few hours after injury contains virtually no fibrinogen, and that its hæmoglobin content is 30-40% lower than that of the circulating blood. The inference is that defibrination occurs rapidly and completely, and that there is an early reactionary effusion. The precipitated fibrin is ultimately organised or absorbed into the walls of the hæmothorax cavity.

In most cases well-controlled needle aspiration can be used to evacuate a hæmothorax completely, leaving only a little local pleural thickening which clears up adequately with expansion breathing exercise. Shreds of clot and fibrin which block the aspirating needle can be removed through a thoracoscopy cannula, but in some cases a more massive basal shadow on radiography suggests the presence of a clot which has to be evacuated through a small thoracotomy incision. Effective treatment of a more or less uncomplicated hæmothorax on these lines will produce an admirable functional recovery, as BARRETT emphasised in these columns last week.

There are, however, cases in which, through delayed treatment or added complications, an obvious massive clot is found in the pleural cavity. This group demands adequate recognition. There are several possible reasons for the unusual behaviour of the extruded blood. If blood is slowly poured out into the pleural cavity the movements of the thoracic viscera may be so little disturbed that defibrination does not take place. This is particularly likely when extensive pleural adhesions resulting from some previous disease or injury mechanically limit the size of the hæmorrhage. The resulting hæmatoma may then resemble an encysted hæmatoma in other parts of the body. This is the one true form of "clotted hæmothorax." The more usually designated clotted hæmothorax, recognised in the later stages, is strictly a clotted fibrinohæmothorax.[1] Here the irritative effect of blood on the pleural surfaces produces a serous effusion,

1. Lush, R. W., Stevenson, C. R., Nicholson, J. C., Nicholson, W. F. *Lancet*, 1944, ii, 467.

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which may attain a large size. The effusion dilutes the blood; hence the fall in hæmoglobin content observed by SELLORS in successive aspirations; it also causes the fibrinogen content of the fluid to rise after its original fall. Sometimes the fibrinogen content rises above the blood-level, suggesting that this is an active rather than a passive effusion. The effect of such a fibrinohæmothorax on the pleural cavity is often an extensive deposition of fibrin on the visceral and parietal surfaces, which seriously hinders obliteration of the space. In addition a mass of clot forms in the cavity which can only be removed by definitive surgery. Lately, evacuation has been supplemented by removal of the fibrin layer from the surface of the lung by decortication. In this operation the firm encasing layer of fibrin is peeled off the lung surface and cleared from the adherent edges between the lung, diaphragm, and parietes. LUSH and his colleagues[1] claim that rapid expansion can be obtained in this way and delay in convalescence avoided. The decortication can be assisted by the introduction of penicillin into the pleural cavity to overcome potential infection. Temporary drainage and aspiration must also be used to remove collections of bloodstained serum. This procedure has considerable possibilities.

The treatment of hæmothorax, then, is no longer a conservative procedure aimed only at preventing infection. In its present form it comprises two parts: thorough and early evacuation of the pleural contents, and really vigorous attempts to restore full expansion of the collapsed lung by systematically planned breathing exercises. Even slight delay in emptying the pleural cavity may lead to a chain of events that seriously hinders functional recovery. The patient may be incapacitated for months instead of a few weeks.

Annotations

SAFETY IN THE HOME

ELABORATE provision is made by statute for safety in factory and workplace, where the people at risk are all adults. But the homes of the people are also workplaces. Dangerous apparatus is in daily use there, and many of those at risk are old and infirm, or young children. The housewife and her family need protection just as much as the worker, yet we neglect even the most elementary precautions for their safety. Unfortunately, as we descend the scale of housing standards the difficulties of the working housewife become more acute, until we sink to a positive death-trap in the house of one room. In small overcrowded homes the working-space is the only play-room for the children, and poor quality of fittings and apparatus increases the danger. The well-designed gas or electric cooker is too often mocked by a gas-ring which may be laid on the floor or any inflammable surface, and become a trap to the straying infant. In many homes the open fire is the sole means of cooking, and broken fire-bars are a frequent cause of accident. The law requiring the provision of fireguards is widely ignored (and at the present time these safety devices are almost unobtainable). The fireplaces installed in many cheap houses are ill constructed and dangerous when new, and may become deadly when allowed to fall into disrepair. Cooking utensils tell a similar story: many that look as if they were made to be upset are sold without stint; and clothing materials ready to catch fire from a spark find their way into the homes of the poor with no hint of their inflammability.

Little attempt is made to educate people about safety measures, and the result of our common negligence is that thousands of avoidable burning accidents occur every year in our homes. In this issue Dr. Marion Wright tells a plain story of fifty people who have been burned. Ignorance and gross carelessness are important contributory causes; and education and propaganda are obvious remedies. But bad housing, overcrowding, and lack of safety precautions are equally serious factors; it needs no statistical analysis to tell us what should be done.

DEXTRAN AS A SUBSTITUTE FOR PLASMA

FURTHER information has now appeared[1] concerning dextran, which has been claimed to be an efficient substitute for blood-plasma in transfusion. The substance is a neutral polysaccharide, consisting of a water-soluble high-molecular carbohydrate formed in solutions of sugar by the bacterium *Leuconostoc mesenterioides*. Its molecular weight may be many millions, but by partial hydrolysis preparations with molecular weights of 100,000–200,000 can be made, though these, like the original, are not homogeneous with respect to molecular weight. It is claimed that a solute can be prepared by partial hydrolysis which does not give rise to reactions or undesirable sequelæ even after repeated large infusions. The viscosity and colloidal osmotic pressure of the 6% solutions (with 1–3% sodium chloride) which were used for experimental work were about the same as those of blood. After a single intravenous dose the dextran concentration in the blood of a dog falls gradually to zero in three or four days, during which time dextran of lower molecular weight than the original injection can be detected in the urine. There is no evidence of storage, even after repeated large infusions—an advantage over the otherwise efficient gum-saline solutions. Infusions are said to have rapid and lasting effects on the blood-pressure, heart action, and respirations of rabbits and cats subjected to bleeding, histamine shock, and contusion shock, while preliminary clinical trials have suggested that dextran is a better plasma substitute than gum-arabic, polyvinylpyrrolidone ('Periston'), or pectin. Dextran increases the sedimentation-rate in the same way as gum-arabic, and this makes determination of the blood-group a difficult matter.

An easily prepared and efficient plasma substitute would greatly relieve the strain on the blood-donor panel, and such a substance would not carry the ever-present menace of transmissible disease, due to a virus which not even filtration methods can remove. The assessment of dextran's claims, however, will need to be thorough and probably protracted before it can be said with confidence how far this carbohydrate is a complete substitute for natural blood proteins.

A NEW DPM

THE second interim report of the committee on psychological medicine of the Royal College of Physicians sets out proposals for the more thorough training of specialists in psychiatry. The committee note that the establishment of the present diploma in psychological medicine, in 1910, did much to raise the level of psychiatry; but they point out that the standard and scope of this diploma are relatively low, and they feel that the time has come to introduce a higher—or at all events, a more stringent—qualification. They hold that 3 years' clinical experience in appropriate departments and laboratories are essential before a man should be allowed to sit the examination; after that he should have 2 years' experience in whatever psychiatric field he chooses before he receives the title of the diploma.

In the committee's opinion no-one should start on his course for the new DPM until he has held appointments, including that of house-physician, in general or children's

1. Grönwall, A., Ingleman, B. *Nature, Lond.* Jan. 13, 1945, p. 45. See *Lancet*, Jan. 6, 1945, p. 24.

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hospitals, for a year after qualifying. Their 5-year diploma course will begin with 3 years spent in hospitals, clinics, laboratories, and other institutions approved by the examining body as competent to give training. The subjects studied will include the anatomy, physiology, and pathology of the nervous system, clinical neurology, psychopathology, and clinical psychiatry, including mental deficiency. A period of 6 months is to be spent in whole-time work in neurology, and 18 months in mental hospitals or psychiatric clinics. Child psychiatry will be studied for 6 months, including 3 months' work in an institution for mental defectives. The candidate will be expected to make contact with child-guidance clinics and with the school medical service, and to learn how to investigate and treat mental defect, and delinquency and maladjustment in childhood. At least 3 months will be spent at an approved centre for training in psychology, including social and industrial psychology, and 3 months in special study in psychiatry or neurology. At the end of these 3 years the candidate will take the examination, and will then spend 2 years in study, at approved institutions at home or abroad, of any branch or branches of psychiatry or neurology. On completing this period to the satisfaction of the examiners he will receive his diploma and be recognised as a specialist.

The committee note that it must take several years to establish the new diploma and suggest that in the meantime a temporary authority should be set up, empowered to recognise existing specialists and to examine those who have been gaining specialist experience during the war. For the future, they hold that there should be a single examination for the United Kingdom, or that the standard of all examinations should be made uniform. For this purpose, they think, a central board should be set up to coördinate examinations and approve teaching institutions. They frankly admit the financial difficulties which will face candidates for the new diploma—a problem which, as they remark, must be solved.

TREATMENT OF BURNS

THE Glasgow Royal Infirmary receives more cases of burns than any other hospital in the British Isles, and for many years these cases have been segregated in special wards. In 1942 a research unit was formed at the infirmary. The Medical Research Council provided a whole-time assistant (Mr. Thomas Gibson) for the surgeon in charge of the burns wards (Mr. A. M. Clark), and Dr. Leonard Colebrook, of the Council's staff, undertook to direct the laboratory studies and coördinate them with the clinical observations. The pathological and biochemical work was supervised by Prof. J. W. S. Blacklock and Dr. A. Bruce Anderson, and special grants were made to Dr. Alexander Brown and Miss E. Semeonoff. A report [1] issued this week by the Council embodies observations on some 400 patients treated in the wards and nearly 2000 treated in the outpatient department.

Writing on first-aid, Colebrook, Gibson, and Prof. J. P. Todd conclude that with severe or extensive burns no first-aid should be attempted beyond keeping the patient warm and giving morphine if need be; what chiefly matters is to get him to hospital. In other cases avoidance of infection by the hæmolytic streptococcus is the main consideration. For most small burns which are accessible "first-aid at the scene of the accident should usually be limited to covering the injured skin with a recently laundered clean towel, or, better, if it is available, with a sterile cloth"; but when quite superficial small burns are treated at home, or when larger burns cannot receive "plenary" treatment without considerable delay, they may be smeared with a water-soluble cream containing 1% of 'Cetavlon' and 3% of sulphanilamide. This is done with a knife-blade or spoon, with aseptic precautions: the operator's hands must be thoroughly washed and dried, and he should mask his nose and mouth. The burn is then carefully wrapped in sterile lint and a bandage, or in a clean towel; but if possible the cream should be removed within 2 days because of a slight risk of dermatitis.

Gibson and Brown believe that loss of fluid usually continues for 24–30 hours. Adults with burns of more than 15% of the body surface, and children with burns of more than 5–10%, need transfusion of plasma or serum in amounts large enough to replace the fluid lost and prevent hæmoconcentration. Transfusion should begin as early as possible, and its rate should be controlled, throughout the shock period, by repeated blood estimations: the blood-pressure and pulse-rate are much less reliable; indeed the BP may be normal or high though hæmoconcentration has begun. Plasma can easily be given too quickly or in too great amount, particularly in children; and there is special danger of pulmonary œdema in patients who have inhaled hot gases or irritant vapours. Nevertheless "much larger amounts than hitherto recommended are often necessary," frequent observation and a nice clinical judgment being required to strike the happy mean. Until shock is overcome, local treatment should in most cases be confined to application of a first-aid dressing. "Blisters are snipped and a trickle of cetavlon solution is run over the whole surface, which is then covered with sheets of gauze," previously spread with the cream already mentioned. Complete cleansing and dressing are postponed till the 2nd or 3rd day.

The plenary treatment adopted at Glasgow relies largely on cleansing with the detergent antiseptic cetavlon, ordinarily without a general anæsthetic: "under the routine dose of morphine given to patients with severe burns, the cleaning-up process has usually caused little or no pain." After cleansing, a mixed sulphonamide cream is applied—the one now recommended containing sulphanilamide (3 g.), sulphathiazole (3 g.), glycerin (10 g.), castor oil (25 g.), 'Lanette' wax sx (10 g.), and water (49 g.). The burn, which must be widely covered and firmly bandaged, is left untouched as a rule for 7–10 days, or even 12, unless the affected area is such that contamination is unavoidable. A little fever (up to 102° F) is in itself no indication for changing the dressing, for "such fevers are frequently reactions to injury." For routine use the Glasgow workers prefer to give sulphonamides locally rather than orally, and they "have a strong impression that the bactericidal effect we hoped for has to a large extent been achieved both by sulphanilamide and by sulphathiazole." But the hæmolytic streptococcus was able to establish itself in 83 out of 243 inpatients, and they think it unlikely that chemotherapy will ever suffice to guard the great majority of burns from infection throughout the long weeks of healing. What is necessary therefore is to reduce the opportunities for infection during treatment: "we must work out a system of preventive measures, analogous to those of the operating theatre but appropriate to the different conditions obtaining in wards."

That is perhaps the most important lesson of the report. But Colebrook and his colleagues also draw attention to a second big problem that awaits solution—how to deal with the severe protein depletion or other profound metabolic disturbance which so often now kills burnt patients after 3–6 weeks, and probably greatly delays healing in those who survive. Anderson and Semeonoff, in a valuable chapter on the chemical changes they observed, state that the loss of nitrogen in the urine, though large in some of the cases, was not as excessive as that reported by some of the American workers.[2] Badly burnt patients, however, could not

1. Studies of Burns and Scalds. *Spec. Rep. Ser. med. Res. Coun., Lond.* No. 249. HM Stationery Office. 1944. Pp. 209. 4s.

2. See *Lancet*, Jan. 20, p. 91.

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take enough food to replace the protein they had lost, and it may be necessary in such cases to give protein digests intravenously or by intestinal tube. The series of papers concludes with Gibson's autopsy findings in 30 fatal cases, in 11 of which death took place after shock had been overcome. In 5 of these it was attributed to "sepsis, hypoproteinæmia, and anæmia."

VOLUNTARY HOSPITALS AND PLANNING

PUBLISHERS of yearbooks, like publishers of journals, nowadays work under difficulties, and the Central Bureau of Hospital Information now produces, with apologies, its yearbook for 1943–44.[1] This covers two years, and though the financial review is based on hospital reports for 1941, every effort has been made to bring up to date the directory sections that make this work invaluable. The editor, Mr. A. E. Ceadel, has also included a highly topical article, dated December, 1944, entitled A National Health Service. From comments on the white-paper made by representatives of the local authorities, the voluntary hospitals, and the British Medical Association, the writer extracts agreement on several major issues—notably on the constitution of planning bodies, which should comprise representatives of all three parties interested, and on the size of planning areas which should be much larger than those the Government intended to be administered by joint boards, and should wherever possible include a university. The fundamental task is to make readily available to everybody the medical services they need, and a fundamental obstacle is the maldistribution of doctors, both general practitioners and consultants. "The problem of maldistribution," it is suggested, "will be solved in part by the manner in which consultants and specialists may be appointed to a small group of hospitals, having liaison with the big teaching hospital; and in part through the realisation that the economic conditions of tomorrow will make it necessary for all members of hospital medical staffs to receive payment for their hospital services." This principle is already accepted by the voluntary hospitals and the BMA. In the opinion of the yearbook there is indeed more agreement than is generally realised between those who must be the principal agents in giving effect to "a proposal magnificent in conception, revolutionary in nature, but of necessity evolutionary in accomplishment."

RECURRENT RHEUMATISM

UNDER the name "palindromic rheumatism" Hench and Rosenberg[2] describe a recurring disease of the joints and adjacent tissues which they have studied in 34 cases admitted to the Mayo Clinic since 1928. Its outstanding features are multiple afebrile attacks of acute arthritis and periarthritis with pain, swelling, redness, and disability, usually only of one but sometimes of several large or small joints in adults of either sex. The attacks appear suddenly and develop rapidly. They mostly last only a few hours or days and then disappear completely, but they recur repeatedly at irregular intervals. Despite frequent recurrences and a transitory acute or subacute polymorph exudate in the articular cavity, little or no constitutional reaction or abnormality is revealed by laboratory tests, and no significant functional, pathological, or radiological evidence of general or local disease is found even after scores of attacks. A curious feature of several of the cases was the appearance of subcutaneous nodules whose histology appeared to be entirely non-specific; while in one case small red tender palmar "sore spots" were repeatedly noticed.

The laboratory data were all negative; the blood uric acid and sedimentation-rate were within normal limits, and in every case urine analysis and the Wassermann reaction gave normal readings. Biopsy material was obtained from the synovial membrane of a number of patients during the acute attack, and it was found that at such periods there was rapid onset of acute inflammatory reaction with periarticular œdema and gross thickening of the capsule. Polymorphonuclear cells appeared within the synovial membrane in large numbers, but no significant eosinophil reaction was seen. A fibrinopurulent exudate sometimes appeared within the joint cavity at a later stage. As the attack subsided all these changes resolved, and a period followed during which fibroblasts proliferated actively within the capsule and synovial membrane; but later all signs of inflammation cleared rapidly and the joint returned to normal. Cultures from the exudate both in the joint and in the tendon sheaths remained sterile; and the follicle-like collections of lymphocytes regarded by Alison and Ghormley as characteristic of the rheumatoid reaction were never present. The nodules examined histologically presented the reaction of non-specific low-grade inflammation only, not resembling Aschoff bodies or the subcutaneous tophi of gout. Although Hench and Rosenberg are inclined to attribute an allergic origin to their cases, they differentiate the changes observed from those seen in angioneurotic œdema or urticaria, and they are unable to elicit any factor constantly predisposing to or precipitating attacks. Investigating the possible association of the articular reaction with infection, they found that the attacks bore no apparent relation to acute exogenous infection, while most of the patients had long since been relieved of possible foci of infection.

Between 1911 and 1913 Solis-Cohen[3] reported 27 cases of a condition which he named "angioneural arthrosis," which he believed to be commonly mistaken for rheumatism or gout. His cases were somewhat similar to those now described by Hench and Rosenberg, but with the significant difference that 40% of his patients were febrile and had skin eruptions during their attacks, which were more often polyarticular. Read in the light of modern knowledge, it may be wondered whether Solis-Cohen's cases may not have been manifestations of chronic meningococcal septicæmia. Hench and Rosenberg's cases approach more closely those observed by Kahlmeter[4] in 1939 and considered by him to be probably of allergic origin; but Kahlmeter's patients, like those of Solis-Cohen, often showed fever and erysipeloid rashes during their attacks.

Discussing treatment, Hench and Rosenberg are inclined to think that histamine desensitisation may have been of some value, but apart from this they fall back on the use of heat and general analgesics during attacks, since in most cases the pain was severe and in some it was agonising. However, "there appears to be little or no tendency for attacks to lengthen and become confluent, that is chronic, in a given joint. The disease is a great nuisance to many, a notable handicap to some. But despite the thousands of attacks suffered during a grand total of at least 307 years of illness (242 prior to, plus 65 years since admission), not a single joint has been crippled permanently."

THE Minister of Fuel and Power has appointed Prof. J. M. MACKINTOSH to be a member of his advisory council.

THE next session of the General Medical Council will open on Tuesday, Feb. 27, when Sir HERBERT EASON, the president, will take the chair at 10 AM.

WE have to record the death on Jan. 25 of Mr. HAROLD COLLINSON, consulting surgeon to the General Infirmary at Leeds, at the age of 68. Also, on the same day, of Sir HERBERT SMALLEY, a former Prison Commissioner, in his 94th year.

1. Hospitals Year Book. Pp. 291. £1 1s. From the bureau at 12, Grosvenor Crescent, London, SW1.
2. Hench, P. S., Rosenberg, E. F. *Arch. intern. Med.* 1944, **73**, 293.
3. Solis-Cohen, S. *Amer. J. med. Sci.* 1914, **147**, 228.
4. Kahlmeter, G. *Acta med. scand.* 1939, **102**, 432.

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Special Articles

RELATION OF BURNING INJURIES TO SOCIAL CIRCUMSTANCES

MARION T. WRIGHT, MB GLASG., DPH

DURING the period from December, 1942, to March, 1943, an inquiry was made into the circumstances associated with 50 burning injuries, and in particular into the relationship of these accidents to social conditions. The injuries were sufficiently severe to warrant the admission of the patients to the Burns Unit of the Glasgow Royal Infirmary (under Mr. A. M. Clark). The group forms an approximately random sample of the patients in the unit during that period. Whenever practicable, a personal interview with the patients—or in the case of children with their parents—was secured and the houses visited, within a few days of the accident.

The patients fell into two clearly defined groups—45 domestic cases, and 5 industrial cases. The preponderance of domestic cases is striking. As might be expected, most of the sufferers in this group were children and elderly people; 36 were under 14 years of age, and, of the remaining 9, 5 were aged people, 1 suffered from epilepsy, and 1 was already weak through a long illness.

DOMESTIC CASES

In the domestic series the most common factors present were: (1) overcrowding, (2) lack of fire protection, (3) poor housing conditions combined with low-grade intelligence, and/or carelessness on the part of the responsible adult. All but 2 were judged to be "avoidable accidents."

Overcrowding.—Judged by the standard defined in the Public Health Housing Act of 1936 there was overcrowding in 23 of the 45 homes. In some cases the overcrowding was gross.

Case	2	..	2 adults and	4	children	living in	1	room	
,,	8	..	2 ,,	,,	5	,,	,,	,,	1 ,,
,,	9	..	4 ,,	,,	2	,,	,,	,,	2 rooms
,,	10	..	4 ,,	,,	3	,,	,,	,,	1 room
,,	12	..	3 ,,	,,	10	,,	,,	,,	2 rooms
,,	26	..	2 ,,	,,	6	,,	,,	,,	2 ,,
,,	40	..	3 ,,	,,	5	,,	,,	,,	2 ,,
,,	43	..	3 ,,	,,	5	,,	,,	,,	2 ,,

Of the 45 families, 14 lived in single-apartment houses (i.e., a single room), and 24 in two-apartment houses. Even the meagre furnishings of many of these homes so completely filled the small available floor space that the only free area, where a child might play, was immediately in front of the fireplace. Of the 45 homes, 33 were ill-kept, dirty, and showed no evidence of interest on the part of the housewife.

Lack of fire protection.—In the terms of the Children Act of 1908 it is a punishable offence to be without fire protection in a home in which dwells a child under 7 years of age. In not one of the 45 houses was there a fire-guard! In 39 houses there were children under 7 years of age. Most of the parents were aware of the terms of the Act, but had taken no steps to fulfil them; a few said that fire-guards were unobtainable; one mother said she had magnanimously contributed her guard to the local "salvage drive." Nineteen of the accidents would have been impossible, and 5 improbable had there been adequate fire protection. In 5 cases the burning was due to direct contact of clothing with the flames.

Mary A, aged 6 years, was standing in front of the fire with her brothers and sisters, singing a hymn, when her frock caught fire. She died 3 days later.

Mrs. B, an old lady, was reaching up to the mantelpiece for some thread when her flannelette nightgown caught fire from the range. Fatal case.

Mary C, aged 1 year, was standing in front of the fire (interior grate type) when her silk frock caught fire.

D, aged 2 years, was sitting on the foot-high broad kerb in front of an interior grate when she fell backwards into the fire.

Mrs. E, an old woman living by herself, was warming herself in her flannelette nightdress in front of the fire before getting into bed, when the nightdress caught fire. No fire-guard and no kerb. Fatal case.

The construction and ill-repair of the fireplace were sometimes contributory factors.

The front bar of a range fire was so loose that it fell down of its own accord from time to time. On one occasion a pot of soup was resting on the bar when it fell, with the result that the soup spilled over F, aged 3½ years who was sitting by the fire.

Carelessness, on the part of the adult victim, or the parents or guardians of children, were common. Thus Mr. G. set fire to his blankets while mending a boot. Although he lost the whole of the skin of one leg this did not prevent him setting fire to his bedclothes again, while in hospital, with a cigarette. (In several other instances, not included in this inquiry, severe burns were caused by cigarettes while the patient was asleep or drunk.) In the burns and scalds of children gross carelessness was an outstanding feature. The tubing from gas-rings was allowed to be within their reach; in other cases the careless placing of the cooking utensils on the fire was responsible, their handles jutting out at right angles to the fireplace.

John H, aged 4½ years, was sharing a chair in front of the fire with another boy. The other boy pushed and John fell over but tried to save himself by catching the handle of a pot which was jutting out from the fire, so that the boiling contents of the pot fell over him.

Mrs. I was stirring soup—with the handle of the pot jutting out—when her child of 3 came against the handle and spilled the soup over the mother's legs.

Mrs. K was taking boiling potatoes from the fire when her sleeve caught on the projecting handle of the pot and the boiling water spilled over her foot.

Mrs. L was in the habit of drying odd garments on the projecting handle of a pot sitting on the fire. Her 18-months old child, crawling about the floor and just learning to walk, caught at the dangling garment to pull herself up and pulled the pot over. The mother continued this foolish practice even after the accident.

Lack of adult supervision was noted in 10 cases, 5 children being burned when no adult was in charge, 2 while their mothers were ill, and 3 when their mothers were pregnant.

INDUSTRIAL BURNS

The series of 5 cases is so small that no conclusions can be drawn as to underlying factors, but the cases form an interesting comparison with their domestic counterpart. All 5 were burns—there were no scalds—while in the domestic series 29 of the 45 accidents were scalds.

CONCLUSION

About 45 of 50 injuries by burning inquired into, 5 of them being fatal, resulted from "avoidable accidents." They should not have happened. In most cases squalid living conditions, and the low standard of intelligence and conduct associated with them, provided the background. Overcrowding left no room for the children to play except in front of the fire. The law which requires a fire-guard to be provided is completely ignored. Prosecutions for failure to comply with it are almost unknown.

War conditions may have played some part but they are not chiefly to blame, for the number of domestic burns applying for treatment at the hospital was almost as large before the war. Nor was poverty, per se, a major factor in the present series. In only 5 instances was there a slight degree of poverty owing to the increased cost of living. In all the other homes investigated the income was adequate, although the amenities were few. In no instance was the burning due to lack of facilities directly caused by poverty.

MIDWIVES FOR THE WEST INDIES.—It is proposed to establish a maternity home in Barbados for the training of midwives as part of the plan to improve the medical services of the West Indies. The scheme will be financed by a grant of £24,000 under the Colonial Development and Welfare Act, 1940.

INSTITUTE OF HOSPITAL ADMINISTRATORS.—This new name has been adopted by the Incorporated Association of Hospital Administrators as being at once brief and appropriate to their status as a professional society conducting examinations and awarding diplomas. The letters designatory of the fellowship (FHA) and of the associateship (AHA) remain unchanged.

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A FACULTY OF OPHTHALMOLOGISTS

TOWARDS the end of the last war a Council of British Ophthalmologists was established, consisting of the presidents and past presidents of the Ophthalmological Society of the United Kingdom and of the ophthalmological section of the Royal Society of Medicine, together with 9 members elected annually, 4 each by the councils of these bodies and 1 by the council of the Oxford Congress. Later the master and the past masters of the Oxford Congress were added as permanent members and the number of elected members increased.

Recently it has been felt that the Council would have more authority if it were more directly representative of the whole body of ophthalmologists.

As part of a National Health Service the Government intends to establish an ophthalmic service. This raises questions not only of conditions of service, but of the relation of the ophthalmic practitioner to the dispensing and sight-testing opticians, the methods of spectacle supply, and the establishment and control of clinics. Moreover, the term "ophthalmologist" will have to be defined and the regionalisation of hospital services will require planning. In addition, education and research, clinic and hospital policy, industrial problems, and a host of other questions will assume importance in the immediate future.

It is thought advisable that the whole body of ophthalmologists should play a part in the institution of such policies as they affect their specialty, and should possess a mechanism to influence their development. The Council of British Ophthalmologists have therefore decided to promote the formation of a Faculty of Ophthalmologists whose functions will be:—

1. To take cognisance of, and to act in, any matters of ophthalmic interest.
2. To encourage suitable standards of education in ophthalmology for undergraduate and postgraduate students.
3. To encourage research in ophthalmology and cognate subjects.
4. To secure such conditions in ophthalmic practice as will attract persons of high professional attainments and afford ample scope for the exercise of their abilities.
5. To maintain a high ethical standard in ophthalmic practice.
6. To act as an authoritative body for the purpose of consultation in matters of public and professional ophthalmic interest.

It is proposed that the Faculty shall consist of members and associates. The following will be eligible for membership:

1. Ophthalmic surgeons to hospitals recognised as schools of ophthalmology by universities or other medical examining bodies.
2. Ophthalmic surgeons other than the above who have been engaged for at least five years in full-time practice as specialists and have charge of beds in voluntary hospitals approved by the Council. (Provisionally, these will be general hospitals of more than 200 beds and special ophthalmic hospitals of more than 20 beds.)
3. Persons no longer on the active staffs of hospitals who have held appointments specified in (1) and (2).
4. Other ophthalmic surgeons of consultant rank approved by the Council, including those in the Services or holding Government appointments.

Any ophthalmologist who has spent at least two years in full-time practice as a specialist (civilian or Service) will be eligible for election as an associate. Members will pay an initial subscription of three guineas and associates one of one guinea.

Executive powers will be vested in a council which, for the sake of continuity, will be known as the Council of British Ophthalmologists. This will have 21 members, of whom 15 will be elected by members and 6 by associates. When the new council is established it will assume all the function of the present Council of British Ophthalmologists, which will hand over all its records and any other property in its possession.

Forms of application for enrolment as members or associates may be obtained from the hon. secretary of the organising committee, Mr. Frank W. Law, FRCS, 45, Lincoln's Inn Fields, London, WC2.

Reconstruction

WILL SICKNESS CLAIMS INCREASE?

FOR how much post-war invalidity must we plan? Some commentators speak easily of reductions following the introduction of a National Health Service. But these cannot be assumed.

Statistically, each man is expected, on average, to claim benefits which vary with each year of age and which run from 0·61 week's sickness plus 0·26 disablement at age 24 up to 1·52 weeks' sickness and 1·80 weeks' disablement at 55, and 2·35 weeks' sickness and 5·40 weeks' disablement at 64. There are separate rates for women, distinguishing married women from the others.[1]

Curiously enough, contemporary man is expected to behave as his father or grandfather did 50 years ago; for the figures are calculated on what is called "Manchester Unity experience 1893–97" with a loading of 12½% to provide "a necessary margin for cases where the liability is above the average. In cases where such a margin is not required it supplies a provision for additional benefits following the valuation."[2] And now the Government Actuary adds a further 12½% "having deemed it essential, in view of the fundamental changes from the existing scheme, to provide an appreciably higher claim rate than that prevailing hitherto." This expression of view, set out in his appendix to the white-paper on Social Insurance, corresponds to the same increase which he discussed at greater length in his appendix to the Beveridge report. He then said wisely:

"While it is true that, as the result of the comprehensive health and rehabilitation service which is to be provided in place of the more limited existing medical benefit, a substantial improvement in the health of the community should be secured in due course, it does not necessarily follow that the cost of benefit will be correspondingly abated. This is due to the fact that under the altered arrangements there may be a tendency on the part of the doctors to require longer periods off work in order to secure complete recovery from the effects of an illness, and there will also be less incentive than in the past to return to work owing to loss of income." He concludes "The position is definitely speculative . . ."

Sir William Beveridge in "A reconsideration of rates of contributions for social insurance" published in the *Times* of Jan. 9 appears now to argue against this latest loading and urges that contributions should be reduced in class I on this account "by nearly 2*d*. a week."

Two distinct issues arise. If it is accepted that the contribution should be drawn on "austerity" lines, with the express intention that the State should annually find the cash balance required, then no violent reaction need be expected; comments will turn upon one's general attitude towards the State and its finances. Between the two wars financial caution was the keynote; but in a transitional period, when the burden of taxes and contributions may hamper expansion, there may be good reason to avoid piling up unnecessary reserves and to accept within a flexible Budget the fluctuating balance of sickness expenditure. More especially could this be justified by the fact that the present Health Insurance Fund carries into the new scheme invested assets of the order of £245 million. This nest-egg comes from the system of actuarial valuation of each of the seven thousand separate approved societies and registered branches. It will be no longer needed when the bird disappears. For the nonce it is earmarked as capital; but when the cries have died down, a new Parliament may feel free to consume it.

If, on the other hand, the expectation of sickness is scaled down on the implied assumption that a National Health Service will reduce the volume of weeks' benefit—and that it will be blameworthy if it does not—then a note of warning should be sounded. Ratios of mental and physical efficiency cannot solely be measured by weeks of work lost. In lean times when savings were exhausted, sickness benefits were inadequate, and supplements carried the stigma of the poor-law, many a man has forced himself to attend at work in a condition when medical considerations—or sometimes humane con-

1. National Health Insurance Valuation Regulations, 1938, S R & O 281, p. 12.
2. Cmd. 1662, p. 9.

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siderations—should have kept him at home, on benefit. (We say "attend at work" advisedly, because employers and statisticians will never know how often a decent foreman and sympathetic workpeople have covered the slackness of a sick workman "who could not afford to be ill.") Keen-eyed works doctors with nurses and welfare supervisors are increasingly identifying such cases; and the tendency will not be less when illness means transfer from the pay-roll to a substantial sickness benefit supplemented through an enlightened assistance administration. On a true scale of values this is all to the good; it should lead to an increase of aggregate wealth. But that is not to say that in the nation's vast account-books the fund that bears sickness payments will find its liabilities decrease.

It is often thought that (as Beveridge says in his *Full Employment*) "the general improvement of health, which is lengthening the average total life of men, must also be helping to some extent to maintain their working capacity." But increased longevity sometimes means increased periods of chronic incapacity; some reductions in sickness attributable to a rising standard of health are masked by the longer periods of benefit drawn by invalids whose lives have been prolonged. There is little evidence that public opinion has yet caught up with the insurance-committee president who in 1937 said: "Neither those who believe in a hereafter nor those who do not can justify a heavy expenditure of talents and money merely upon lengthening the earthly days of those who can never work again, unless they are satisfied that all necessary talents and money are already being devoted to the conservation of the highest degree of health for those who may still have many days before them."[3]

FOOD IN 1944

A YEAR ago we reproduced charts comparing the amounts of various foodstuffs made available per head of civilian population in the United States, Canada, and the United Kingdom in 1943 (*Lancet*, 1944, i, 609). Last year, despite expansion of military needs and large shipments to the Allies, food-supplies for civilians in the USA and Canada were in most cases maintained or increased, owing to greatly increased production. Supplies for civilians in this country also showed some improvement, but continued below pre-war levels for many foods and below 1944 Transatlantic levels for dairy products, meat, eggs, sugar, and fruit. These findings are brought out in the second report just issued by the Combined Food Board.

In both the United States and Canada meat consumption in 1944 was nearly 50 lb. per capita more than in the United Kingdom. In contrast, the consumption of potatoes and flour has increased appreciably here during the war, and in 1944 potato consumption in the United Kingdom is estimated to have exceeded that of the United States by 140 lb. per head and that of Canada by 95 lb.

All three countries showed a general increase in consumption of fluid milk in 1944 as compared with 1943. In the United States and Canada meat supplies showed an increase, but evaporated milk decreased. Other important changes were an improvement in supplies of dried eggs in the United Kingdom (which offset a continued decline in shell eggs), an increase in supplies of fresh fruits and vegetables in the United States and Canada, and a temporary increase in the United Kingdom of supplies of citrus fruit. Butter, sugar, canned milk, and canned fruits are rationed in all three countries. Other commodities rationed in the United States in 1944 were margarine, cheese, the more popular cuts of meat, canned fish, canned tomatoes, catsup and chili sauce, and certain canned juices. Apart from bread, potatoes, vegetables, and fresh fish (which is scarce) almost all foods were still rationed here.

Supplies of food in the United States and Canada, measured in nutritional terms, on a per-capita basis, have increased appreciably since before the war. Calories, fats, animal proteins, and vitamin A are below the pre-war level in the United Kingdom, but other nutrients, including vegetable proteins, are appreciably higher. Food-supplies of all three countries in 1944 were considered sufficient to maintain reasonable health.

3. Proceedings of National Association of Insurance Committees, 1937, p. 104.

In England Now

A Running Commentary by Peripatetic Correspondents

COMING home to London from India it is the quietness of the streets, and the general orderliness that strike one most. When two taxis meet in London nobody shouts at anybody, they don't even hoot, whereas in India these are the occasions which make up the day's work. Life out there seems full of material for strife, quarrels and arguments reach a very high order, and as a result every journey provides its incidents. When nothing happens the Indian takes a well-earned rest from strife by lying on the pavement to sleep; obstructing the roadway or footway is nothing to take notice of. Sleeping, squatting, or just parking your vehicle in the fairway seems to be expected, and others going that way make a detour.

No-one could regard war-time railway stations as models of peace and decorum, but so they seem after the indescribable babel on an Indian station as a big train comes in. And here the trains hurry on so. There is none of that pleasant sauntering about, and freedom from any anxiety about the train leaving on time. One is still a little surprised at the way English trains rush through quite important stations. There is, too, an astonishing variety in our landscape. In the short suburban run which I now cover daily you can look out at trees, hills, tunnels, a big place, several small places, a gentleman's park, and a housing estate. What a contrast to the miles and miles of undifferentiated plain, with thorns and scrub, waste water, and no drainage, with miserable looking herds in charge of a couple of infants with sticks. How rich and complicated the life that a few hundred acres of the suburbs here conceal! Yet, nowhere in the world is one so conscious of the pressure of teeming life as in the Indian streets. They seem full to overflowing at all times of the day and half the night as well.

Once again one is struck with the success of price control in England. The shops are mostly far better stocked than when I left a year ago, and few essentials seem to be entirely unobtainable now. In Delhi they would cheerfully try and sell you a torch, telling you at the same time that batteries were unobtainable. At one time only the Army could supply electric light bulbs, and dud bulbs were being sold so they could be returned to the Army for exchange. A new bulb cost ten shillings, but the duds cost less. It was difficult to understand why, during the famine in Calcutta, rice was still served in large quantities in hotels, restaurants, and private houses, often to people who would gladly have gone without, if they had been sure that what they spared would go to those in need.

It was difficult to get any sense of concerted and coöperative action over anything out there, and perhaps my most striking impression on coming home was of the highly developed social sense in England. Here people still take a lot of trouble to help others in small ways—the bus conductor when his rush is over will offer to change your pound note; if the carriage is nearly full someone will move up to make room for you—and a group, in the social sense, quickly forms around you and your problem. It is hard to describe the cold and unhelpful indifference with which a problem is met out there. No-one will take charge and assume responsibility for giving directions. And often they escape on a technical fault. You booked a reservation. Yes? You saw the man write it down and he said the seat would be kept. But he has not written it in my book, so how can I help you? There the matter would be left, with the fatalistic acceptance of misfortune which goes deep in the Indian character. But if you persist, the amazing truth dawns on them that you are not going to take it lying down and are out for a win; then they give in with all the charm of the East, and become kindness itself in trying to find you other accommodation. But they always try the other way first. Now I am home again I can no longer drop my soiled clothes on the floor with any hope of their being picked up, except by myself, and the reluctant, once-a-fortnight English laundry does not encourage the pleasant habit of clean clothes daily. The worst thing about changing within a few days from 90° to 40° F is the immense bulk of clothes one has to

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put on. There is a great deal to be said for white linen and cool silk, sandals and no hat (or their male equivalents), and the informality that goes with them.

Here the war is still imminent and paramount; life is hard, and body and soul have to be kept together, whereas in India they have an engaging way of floating off apart. Unless one has served in the East one cannot appreciate the feeling of isolation which goes with all this. Perhaps that is why, in spite of some amenities which are lacking here, the soldier out East, even in a peace station, feels very hardly done by. He feels all the time a forgotten man; nothing he does has the stamp of reality because it is not shared with those who make up his real roots and attachments. All his acts are a sort of dreary marking time until real life can be resumed, although he may never be actively unhappy. Yes—there is a lot to be said for Britain. With its imperturbable superiority, and its cold and inhospitable bedrooms, it is after all home.

* * *

I was listening to one of the excellent transatlantic broadcasts in the *People to People* series, one night when I heard a description of a tour in a shipyard on the US Atlantic coast, with commentary by various interviewees. I was struck by the reply of one man to the question: "And what is your job?" "I'm a trouble-shifter," he said, and went on to explain his duties. He spends all his time looking for trouble anyplace in the yard, and ironing out the creases.

He performed, it seemed to me, a highly useful service, and was the sort of servant that any busy hospital would be glad to have. I thought of him recently when we were particularly busy in our hospital. The set-up was all too familiar in these days—not enough beds, too many seeking admission, and no place to send some of our occupants. I wished for a trouble-shifting good fairy who would take our chronic sick back to a hospital near their homes, who would wave her wand and transport to a comfortable convalescent home round the corner our skin patients, some of the multi-medical ladies, the chronic arthritis whom nobody wants, and the old lady of 80 with a Pott's, and that other old evacuee of 82 who came to lodge with her daughter's strangulated hernia.

Lately we've been troubled with another type of bed-blocker. He arrived from overseas via a hospital in the north country. He has a walking plaster, or a long and recent scar on the back of his thigh, or a couple of missing terminal phalanges; and his home *is* round the corner. He is a soldier "who is desirous of being transferred to a hospital near his home and is fit to travel by ordinary public conveyance without an attendant." (Why not "who wants to go to a hospital near his home and is fit to travel alone by train or bus?") He is a man who deserves the best his country can give him, and he requires perhaps ten or twenty minutes' attention daily or weekly. Our nearest convalescent home is 20 miles away, and for him without a motor-car is almost as remote as the north country hospital whence he came. So he must be kept "occupying" a bed, a potential trouble-maker, while the civilian waiting-list grows longer; were he an officer he could live at home and attend for his massage as an outpatient.

The soldier I should like to get to a hospital near his home is Sandy, who has lost a chunk of one thigh and is minus a foot. He is a cheerful soul, but I know he is beginning to long for a sight of his wife, bairns, and old parents over the border. May the good fairy grant his wish!

Stop Press: She is going to!

* * *

Feb. 1—and still keeping a diary. There were no less than 9 blue tits on the lawn before breakfast this morning and when I was watching them from the dining-room window suddenly into the middle hopped a tree sparrow, a bird with which I have since a boy always identified myself: neat, dapper, looks like an ordinary sparrow, but by God what a difference! So I knew I was in for a good day and was not surprised when they all flew away as the postman came up the drive, bringing me a handful of letters, one of which was to say that all my work on the Boot Advisory Board is not to go unrecognised—an XBE. Not bad, tho' I had hoped for a ZBE. Still—very gratifying! Didn't tell the wife till I was putting on my coat—she was deep in a letter from Mike in Fiji, which I hadn't time to read. Went up to town with old Saunders who altho' he's my own age looks double. Must have cancer or something, which would mean that his nice little property comes into the market. Put him wise about the coming changes in the Ministry. At the office ticked off two clerks, one of them a bit saucy. One can't sack them now, but when the boys come home I'll be patriotic all right! Had a row with old Danvers on the Uppers subcommittee. Silly old fool, getting senile. However, everybody agreed with me, which made him look rather silly and sick. Don't think he'll last long. At lunch with the usual crowd; put them right about the coming changes. I think they saw I knew something, but didn't say a word about the XBE. When I got home it had sunk in—Molly and the girls very set up! Mike's letter says he's homesick. If only I'd had his opportunity of seeing the world at his age. He enclosed a postcard photograph taken by a hiding missionary about 80 years ago of cannibals dragging body along for a feast. Supposed to be the only time cannibalism and photography have overlapped. He says on the back: "Friends of yours"? Can't think what he means.

Parliament

FROM THE PRESS GALLERY

IN the House of Lords, on Jan. 23, the Earl of LISTOWEL moved the second reading of the Nurses Bill, the object of which, he explained, was to correct a drafting error in the Nurses Act and the Nurses (Scotland) Act of 1943. To protect private patients or hospital authorities from unfair treatment by nursing agencies—such as a demand for excessive fees or the ministrations of an unqualified nurse—these Acts laid down certain conditions to which those who ran these agencies or nurses' coöperations would be obliged to conform. These regulations included the duty to supply only nurses with accepted professional qualifications, to keep detailed records, and to obtain a licence from the local authority. When part II of this Act was re-examined by the Minister to fix the date on which its provisions were to become operative, it was first noted that the expression "agency for the supply of nurses" was so broad and indefinite that it might be taken to cover such perfectly innocuous organisations as county and district-nursing associations. Not only did these associations, being voluntary bodies, enjoy a reputation unimpaired by the sort of conduct against which the Act was aimed, but some of the smaller associations might even find it impossible to carry on if they were obliged to conform to the regulations. The only way to safeguard these associations, while retaining the necessary measure of control for the nurses coöperations, was to narrow down the meaning of "agency for the supply of nurses." The present Bill would expressly exempt from the regulatory provision of part II of the Nurses Acts district and county nursing associations and other organisations doing similar work in rural areas in England, Wales, and Scotland.

QUESTION TIME

Married Women Doctors in the Civil Service

Captain W. R. S. PRESCOTT asked the Chancellor of the Exchequer whether there was a general ban on the employment in Government departments of married women doctors; and whether, in view of their special qualifications, especially for employment in the Ministry of Health, he would consider action to secure their employment in suitable cases.—Sir J. ANDERSON replied: The normal rule is that married women are ineligible for appointment to established posts in the Civil Service, and that women holding such posts should be required to resign on marriage; but an exception may be made, upon application by the woman concerned, in any case where it is considered that the employment of a married woman is advisable in the light of her special qualifications, or special experience in relation to the duties required of her, or of the special requirements of the department concerned. In view of the power to make exceptions in such cases, no special action seems to be needed in relation to women doctors.—Captain PRESCOTT: In view of the shortage of doctors at the present time, which is likely to continue in the future, and of the special adaptability of women doctors for certain branches of the Service, ought not the general ban to be lifted?—Sir J.

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ANDERSON: The case of doctors is certainly very special, and as I have just explained, the general rule can be relaxed. I know of no case whatever in which permission has been refused to a woman doctor.—Captain PRESCOTT: Why should the ban be maintained? Is it not actually redundant?—Sir J. ANDERSON: That is a matter of debate.—Mr. W. GALLACHER: Is not the Government policy one of equality on this question as applied to married teachers? Why cannot it be the same in regard to married doctors?

Mental Nurses' Salaries

Mr. HENDERSON STEWART asked the Secretary of State for Scotland what was the reason for the breakdown in negotiations between the mental nurses' panel and the employers' panel; and, in view of the substantial nature of the State grant for increased salaries to mental nurses, what steps he was taking to secure agreement between the two sides.—Mr. T. JOHNSTON replied: I am informed by the chairman of the mental nurses' subcommittee that at their last meeting deadlock was reached on the question of the period over which the increments in a suggested scale of salaries for ward sisters should be spread. I understand that the subcommittee had not fully considered the details of the scales of salaries for other grades of nurses in mental hospitals when this deadlock occurred. I am anxious that the subcommittee should fulfil its function, and I am in consultation with the chairman as to any assistance I can usefully give to bring about a settlement.

Medical Examination of Returned Prisoners-of-War

Sir J. LUCAS asked the Secretary of State for War if he would see that any prisoners of war who had been rescued from Japanese hands should have the strictest possible medical examination before being passed fit for overseas service, in view of the fact that many had contracted malaria and other tropical diseases.—Sir JAMES GRIGG replied: Returned prisoners-of-war all undergo a searching medical examination and where it is thought necessary they are seen by a psychiatrist as well.

South Wales Miners and Pneumoconiosis

Sir CHARLES EDWARDS asked the Home Secretary whether he was aware that the report of the compensation secretary to the South Wales Miners' Federation stated that there were nearly 3000 miners suffering from pneumoconiosis and waiting for a medical board; and what steps were being taken to increase these boards so as to deal with this very serious state of affairs.—Mr. HERBERT MORRISON replied: I am aware that a very large number of South Wales coalminers claiming to be suffering from pneumoconiosis are awaiting examination by the medical board. In recent months 4 additional doctors have been added to the board in South Wales, making 8 in all, with the view of expediting the examinations, and this number should be sufficient to deal with the normal number of applications.

Animal Research at Cambridge

Sir PERCY HURD asked the Minister of Agriculture what stage had been reached at the animal research station at Cambridge under Mr. John Hammond, D.SC, FRS, in the treatment of cows of good beef type so as to induce the birth of twin calves, thereby promoting the more economical production of high quality beef in this country.—Mr. TOM WILLIAMS replied: The work at this station on the inducement of twinning in cattle by the injection, before mating, of pregnant mare serum hormone has not reached the stage at which its practical application can be recommended. Attempts are being made to test the use of the method under commercial conditions with a few cows on farms in the eastern counties.

Inspection of Milk Producers' Premises

Rear-Admiral T. P. H. BEAMISH asked the Minister what progress had been made towards recruiting the necessary staff for the inspection of milk producers' premises under the Food and Drugs (Milk and Dairies) Act, 1944, and whether the appointed day could now be named.—Mr. WILLIAMS replied: No steps have yet been taken to recruit additional staff for this purpose, and it is unlikely that any progress in that direction will be made while the war with Germany continues. Consequently the Minister is not in a position to give any indication of when the appointed day for the Act of 1944 to come into operation will be fixed.

SICKNESS VISITORS.—Sir WILLIAM JOWITT stated that at present no personnel within the established Civil Service were receiving training as sickness visitors or for other work now being carried out by agents of approved societies.

Letters to the Editor

AN ACADEMY OF MEDICINE

SIR,—The interest excited by the recent proposals to bring the Royal Colleges in London together to a common site has revived discussion of the more important matter of the institution of an Academy of Medicine; to this discussion the leading article in your last issue is a contribution of great value. Your insistence that such an Academy should not be under Government control is wise and indeed necessary. It was for this reason that I suggested in the original article (*Lancet*, 1942, ii, 686), from which you largely quote, that any Government contacts which may be advisable should be at Privy Council level. Whether as affairs have now developed this is desirable or necessary is a matter for discussion; there are advantages in finance and good will, but in no sense should it be a Government Academy. On the contrary, the main function of an Academy at home should be to ensure that the philosophy of medicine remains free, to act as a helpful counterweight to the bureaucratic influence inseparable from any State mechanism, no matter how good its intentions, and to provide the public with an expert and independent opinion on medical matters entirely divorced from politics. Abroad, it should be able to show how great is the ultimate value of international relationships fostered by cultural methods without the taint of economic entanglements or political expediency and be a leading influence in encouraging intellectual contacts and fostering research.

Many changes have occurred since the publication of my original suggestion. The white-paper on the National Health Service has been published and accepted in principle by Parliament, and the several bodies at present dealing with its implementation cannot now be disturbed. The Goodenough report, also accepted by the Government in principle, has provided a mechanism for the invigoration of postgraduate teaching and research with State aid through the universities, and it can reasonably be hoped that this will work well. This leaves the functions of any Academy more simple and more purely "academic" than I had visualised at that time. Two questions therefore present themselves: why have an Academy? and, if it is a good thing, how should it be formed?

It may be said that the Royal Colleges of Physicians, Surgeons, and Obstetricians in London, and the corresponding bodies in Scotland, together with the various faculties and associations formed by the specialties as at present constituted, are suitable to the task of advising the Government in its vast new social responsibilities, guiding a rapidly awakening public opinion, integrating medical thought and progress throughout the Commonwealth and Empire, and mobilising the humanising influence of medicine to aid in restoring the broken culture of Europe. I question it; nor would it seem reasonable that they should be so able if they remain divided without a common endeavour. The reasons for division are specialistic and traditional, both good in themselves but not enough. We in medicine are not really physicians, surgeons, and obstetricians working in separate compartments. As an ophthalmologist I am a part-time physician, part-time surgeon, but whole-time doctor. Nor does the philosophy of medicine differ in London from that in Scotland, or for that matter from other parts of the Commonwealth. And again, the importance of maintaining a unified medical philosophy is further emphasised by the diversity existing among the dozen or more Government departments which administer medicine, many of which look upon it from different viewpoints—whether it be that of Health, Education, or Labour, or the several ministries dealing with industrial medicine, or those administering it in England, Scotland, Wales, the Colonies, or the Services. The necessity for an Academy of Medicine may be measured by the answers to these questions:

If the practice of medicine becomes more and more an affair of the State, is the profession provided with a body powerful enough to preserve the soul of medicine in its personal and creative aspects without which it cannot live?

Is professional medicine in this country doing all it might to invigorate our national life?

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Does it form the natural centre of medical thought throughout the British Commonwealth ?

Is it ready to exert the leading medical influence in post-war Europe that so many peoples there now desire to replace the dominance hitherto exercised by Berlin ?

For all these the potential is here ; but are the means and the direction at hand ?

How an Academy should be constituted is at this stage a matter for discussion. So far as I am concerned (at present) I should like to see the colleges and other similar bodies retain their individuality, maintain their traditions, and exert a still greater influence than hitherto each in its own particular field. But I should like to see them choose their best and give birth to something new, by evolution and not by revolution, so that, working in combination for common ends, British medicine could seize the unique opportunities of a rapidly changing and exciting age. And it should not be the colleges and specialist associations in London alone, but those also in Scotland and, for that matter, in the Commonwealth. Otherwise I see a continuation of the drift of past years—an unorganised profession at home, a looking of the students of the Commonwealth to New York instead of London, and a failure in British medicine to add greatly to the humanity and stability of society.

London, W1. STEWART DUKE-ELDER.

SUDDEN DEATH AFTER INTRAVENOUS NEPTAL

SIR,—We read with interest Dr. Rennie's paper of Jan. 13. There is no doubt that many deaths have been directly attributable to the mercurial diuretics, but clinicians are perhaps reluctant to publish such results. It appears desirable to collect all possible data in these cases, in order to arrive at the exact mode of death. The following case in many ways resembles that described by Rennie.

A boy, aged 14, was admitted to the Royal Northern Infirmary, Inverness, on Sept. 29, 1944, with a history of backache of six weeks' duration and swelling of the face and ankles of more recent origin. On admission the boy was generally œdematous. The heart was slightly enlarged ; BP 130/80 mm. Hg. There was a small quantity of fluid at both bases ; no ascites was present. Fundi and CNS were normal. The urine contained much protein, sometimes over 2%, and some scanty red cells and casts. Biochemical findings were as follows—

Date	Plasma-proteins (g. per 100 ml.)		Blood-urea (mg. per 100 ml.)	Blood-cholesterol (mg. per 100 ml.)
	Alb.	Glob.		
Sept. 30	2·8	2·2	81	432
Oct. 20	..	..	72	..
Oct. 31	3·6	2·4	..	..
Nov. 3	..	..	..	384
Nov. 21	..	..	36	..

On Oct. 1 the patient was put on a diet containing 40 g. of protein daily, with restriction of fluids and salt. By Oct. 15 the œdema, which had diminished slightly, had again increased. It was decided to administer plasma intravenously over a period of 24 hours. At the beginning of the sixth pint, which was reconstituted dried plasma (the previous 5 pints were undried plasma), a rigor occurred and administration was stopped after 5 pints 4 oz. There was no effective reduction of the œdema or proteinuria, so it was then decided to try mercurial diuretics. On Nov. 13, 16, 18, and 24 'Neptal' was given intramuscularly. After one of these injections severe headache was noted ; it was paroxysmal but similar headaches had occurred before neptal was used. The diuresis obtained was fairly satisfactory, so 8 days later (Dec. 2) a further course of neptal was begun ; 2 c.cm. was given intravenously without any untoward effect. On Dec. 5 the intravenous injection was repeated, but this time with a fatal result. Symptoms before death were similar to those described by Rennie ; there was cyanosis and collapse, followed by death within two minutes. At autopsy, apart from the renal lesion, there was nothing to explain the sudden death.

This case is similar to Rennie's in that both had renal œdema with low plasma-proteins and death appears to have been due to sensitivity to mercury. Another feature of our case was the reaction noted after the administration of plasma. These cases clearly indicate that intravenous mercurials should not be used in such types of nephritis. It is only fair to mention that the makers of neptal record that fatalities have occurred, probably of an anaphylactic nature, in cases of nephrosis, and advocate intramuscular injections in patients with such lesions.

Royal Northern Infirmary, Inverness. ARCHIBALD DICK.
D. G. LEYS.

HOSPITAL FOOD

SIR,—I should like to add several more reasons to those you have mentioned as common causes of indifferent food service in the average hospital.

At the hospital for which I speak the normal bed occupancy is around 400 and the number of staff who have meals is roughly 200. The food allowances are good, and the catering—though not the buying—is in the hands of a domestic-science-trained team of four : three of them—with manual grade help—are responsible for the cooking only. We are at some disadvantage in the matter of kitchen equipment, and we have insufficient modern food conveyors ; but I am convinced that our greatest disadvantage is in what happens after the food reaches the ward kitchen. Delays of all kinds interfere with the service from that stage—morning dressings and treatment held up for some reason, dressings down for inspection, visiting medical staff doing ward rounds, resident medical staff requiring sisters' assistance to set up drips, transfusions, or other such emergency treatment. As a result the service of the most important meal of the day is of necessity left to the discretion of the nurses in training—few, if any, staff nurses being available to deputise for sisters. Also on account of these untimely medical visits, there is often a demand for bedpans or urinals from patients who had waited for the end of the medical visit before asking for this attention. These demands reduce the number of nurses available to take round the meal. Despite a time-table which allows 45 minutes for its service, dinner is thus late, and the time arrives when half the number of nurses on duty must go for their own meal, causing further protraction.

Visiting and resident medical staff would contribute considerably to the improvement of the situation if they would realise how far-reaching are the results of their calls on the ward sister's help at the time when she should be free to give her personal attention to this most important function.

I entirely agree that it is not a good plan to be taking round bedpans while people are eating, but I can assure you that this is not done from choice by the nursing staff but on account of insistent demands by certain patients.

MATRON.

PSYCHIATRIC CASUALTIES IN MALTA

SIR,—Being a civilian doctor, I am unable to throw light on the incidence of Service psychiatric casualties during the siege of Malta (*Lancet*, Jan. 13) ; but some remarks on the psychological reactions of civilians may be of interest.

I left Malta at the end of 1943 and was on the island throughout the siege period, 18 months of which were spent in the civilian mental hospital. One of the striking features of those eventful years was the extraordinary absence of mental ill health. It is remarkable, too, that during the worst months of the blitz a drop in the admission-rate to the mental hospital was registered. This is significant in view of the fact that, owing to the disruption and destruction of homes, one expected that many patients who were normally looked after by their own relatives would be referred to hospital as their nursing at home became more difficult.

Everyone on the island was aware that the struggle was one for survival and that no quarter would be given us by a determined enemy. Every home, man, woman, and child was in the front line. There was no question of running away in such a small area as Malta (less than 100 sq. miles). At the outbreak of hostilities it was

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feared that the people, who had not seen war face to face for over 120 years, would react to the stress and strain of air bombardment in an exaggerated and abnormal manner. We were, however, pleasantly surprised by the absence of anything that could be called panic. Their attitude was a mixture of curiosity, fear, hate, and aggression, with the last two features predominating as time went by.

To the preoccupation about bombing must be added the ordeal of hunger (only about 13 days' siege rations were available by the time the island was relieved), the fear of disease (there was an outbreak of typhoid and of poliomyelitis), and the constant threat of invasion. Yet in spite of these exacting circumstances, which may be considered likely to act as precipitants of psychiatric illness, there were none of the breakdowns or untoward reactions that Mira noted among the population of Barcelona. One, therefore, wonders how far war is a factor in the incidence of mental ill health while the conflict still exists. On the other hand, it is clearly premature to reach conclusions, and to exclude the possibility of psychiatric disorders appearing as a sort of "delayed reaction" when the conflict is over and the population has to adapt itself to the complex changes that follow in the wake of war.

Edinburgh. PAUL CASSAR.

PERLÈCHE

SIR,—In THE LANCET of Jan. 27 there appears an annotation based on a recent address by Finnerud on "perlèche," his main theme being that the word is a useful one to retain as covering a variety of conditions affecting the angles of the mouth which cannot be distinguished from each other. On two previous occasions (*Practitioner*, 1941, **146**, 303; *Brit. med. J.* 1944, ii, 140) I have put in a plea for banning this word from the English language; I would like to do so again now.

Your annotation makes Lemaistre responsible for the derivation of the word perlèche, but this is not quite true; he merely adopted a word in common use among the people to denote a symptom. He adopted it to indicate a specific lesion, with a specific cause. I submit that if used at all in this country, it should be reserved for the specific condition described by Lemaistre due to a streptococcus. But why use a French word at all when writing in English? We might just as well use the French word "la gale" when we wish to speak of the itch (scabies)! Further, if the condition described by Lemaistre was not due to a streptococcus the greater the reason for suppressing the word perlèche—it may well have been due to a riboflavine deficiency. Surely there can be no excuse for propagating such a hybrid as "pseudoperlèche." So much for the name: now for the condition.

In your annotation you write: "Faced with such a list (of conditions mentioned by Finnerud) the nutritional expert must obviously exercise caution before he diagnoses riboflavine deficiency on the mouth-angle lesions alone." There is truth in this observation; obviously the nutritional expert, who has spent most of his time in a laboratory, would have difficulty when faced with a case of angular stomatitis. On the other hand, it is my belief that after longer clinical study of these several conditions listed by Finnerud, and their evolution, the confusion which has arisen from want of care in making observations will disappear. The experienced clinical nutritional expert finds less difficulty, I think, than has been suggested, in making a correct diagnosis.

London, W1. HUGH S. STANNUS.

EXAMINATIONS IN INDIA

SIR,—Many letters have appeared in your journal from serving officers decrying the lack of opportunity for taking higher degrees. Many doctors are at present in India and have both time and clinical opportunity for study; I understand that it was for this reason that the Royal College of Physicians held one examination for the membership in India. I have learnt, however, that it is unlikely that another such examination will be held in the near future. It would be a great encouragement to serving officers like myself, who are destined to spend several years in India, to think that this decision might be reconsidered.

CAPTAIN, RAMC.

On Active Service

CASUALTIES

DIED

Captain W. R. THOMSON, RAMC

WOUNDED

Lieutenant E. C. LISCUMB, RCAMC

AWARDS

OBE (MILITARY DIVISION)

Colonel DAVID PROUDFOOT LEVACK, MB, RAMC

OBE (MILITARY DIVISION)

Lieut.-Colonel JOHN ANDERSON CHAPEL, MD, RAMC

MBE

Surgeon Lieutenant M. J. BROSNAN, MB BELF., RNVR

MC

Captain T. G. CAMERON, MB DURH.

Captain Cameron is the medical officer attached to the 13th/18th Royal Hussars. On the morning of July 18 he established the regimental aid post in a field at Escoville, prepared to deal with any casualties incurred by the regiment at Toufreville and Sannerville. During this action and throughout the day, the post was subjected to almost continual mortar and shell-fire. In addition battle casualties were coming in for attention in a steady stream. With complete disregard for his own personal safety and under heavy and continuous fire, Captain Cameron rendered immediate assistance to all casualties, though the only cover he had was a small trench under the awning of his half-tracked vehicle and he himself had been hit in the leg by a mortar splinter. This officer's cool and skilful behaviour was an inspiration to all with him and no wounded man was left unattended throughout the heavy mortaring and shelling which was making conditions extremely difficult.

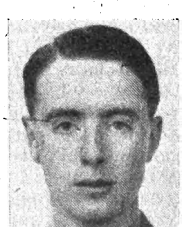
MENTION IN DESPATCHES

Surgeon Lieutenant R. C. P. ALDRIDGE, MRCS, RNVR

MEMOIRS

Major BARNETT FREEDMAN was at the time of his death on Dec. 2 deputy assistant director of medical services (nutrition) at the headquarters of the Allied Land Forces, South East Asia Command. He qualified MRCS at the Middlesex Hospital in 1939, and was resident medical officer at the Albert Dock Hospital during the heavy air-raids on the docks area. He joined the RAMC at the end of 1940, and served in Wales till he was posted abroad in 1942. After a year on the North West Frontier, his special knowledge of nutrition caused him to be appointed as adviser in this specialty, first to Central Command, and latterly to Allied Land Forces. His work to improve the nutrition of British and Indian troops was an important contribution to the war effort and earned for him a considerable local reputation. He travelled continually and he examined some 40,000 men in the course of his surveys. His personality, especially his modesty and sense of humour, endeared him to those with whom he was associated. His death leaves a gap hard to fill and removes a man of great promise.—H. L. M.

Captain C. S. R. LOWDON, who was killed in action in Western Europe in November, was the younger son of the late Rev. C. Ross Lowdon of Greenock, and nephew of the Misses Gilchrist of Edinburgh. He was educated at the Royal High School, George Watson's College, and Edinburgh University. Like his brother Andrew, now in charge of the surgical side of a hospital in France, he was a senior president of the Royal Medical Society of Edinburgh. He graduated MB in 1942 and held a house-appointment at the Royal Infirmary under Prof. J. R. Learmonth who writes: "Stewart Lowdon first attracted my notice when he was a dresser in my wards by his competent devotion to his work. This quality pervaded his later duties as my house-surgeon; and one soon realised that he had set himself the highest standards both of work and of conduct. All his work was done punctually and well, and with that quiet unobtrusive confidence which at once gained the trust of senior colleagues, nursing staff, and patients. Whatever the path he would have chosen for himself in the profession, he would have graced it as much by his character as by his competence."



Sergeant Harrogate

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Obituary

HENRY GAUVAIN

KT, M D, M CHIR. CAMB., M D (HON.) MELB., F R C S

ONLY those who remember the mutilated joints of the past can appreciate the full extent of the revolution in the treatment of bone and joint tuberculosis in the early years of this century. That it all happened so smoothly and with so little acrimony was largely due to Sir Henry Gauvain, one of its leaders in this country. He brought to the work a cheerfulness and good humour which were infectious, and when the revolution was complete and Alton became a place of pilgrimage it was this same happy personality that inspired all who visited the hospital.

Swaine

Born in Alderney in 1878, Henry John Gauvain was the son of Captain William Gauvain, receiver-general for the island. He won a scholarship at St. John's College, Cambridge, took a first-class in the natural sciences tripos, and entered St. Bartholomew's Hospital as senior science scholar. Qualifying in 1906, he became successively house-surgeon, midwifery assistant, and clinical assistant in the orthopædic department. With this somewhat limited experience of surgery he was appointed in 1908 first medical superintendent of the Lord Mayor Treloar Cripples Hospital at Alton. But though he had qualified only recently, he was 30 years of age, and he soon proved himself exactly fitted for the post.

In a paper published in these columns in 1912 he was already taking the modern view he has done much to create. Objecting to the term "surgical tuberculosis," he pointed out that this is a general disease demanding general treatment. "Life in the open air, far from towns, in a dust- and germ-free atmosphere, and under the bactericidal and tonic action of the sun, is a first principle of antibacillary therapeutics." He drew attention to the model provided by Berck-sur-Mer in France—a town that did not attempt to entertain holiday-makers but had as its industry the treatment of the tuberculous. The best results, he thought, would be got by having two conjoined establishments, one in the country and one at the seaside, so that children could be transferred from one to the other. This plan was realised when the Treloar Hospital acquired a seaside branch at Hayling Island. Bathing and exposure on the seashore he found the readiest means of increasing basal metabolism; but those who could not respond must on no account be exposed to such strong stimuli before they had been fortified. The changes in blood and metabolism on exposure of the skin to light and air were further studied at Alton and Hayling Island by Leonard Hill, who recognised the powerful effect of alternation, which makes the English climate so stimulating to those who run about naked on the seashore or live on verandahs. Deliberate heliotherapy was also practised at Alton almost from the first, and in 1914 Gauvain could remark that on any sunny weekday a couple of hundred children could be seen receiving carefully graduated treatment in the sunlight.

It was not surprising that his was also the first country hospital to have a properly equipped light department, and his account of it, given to the electrotherapeutic section of the Royal Society of Medicine, can be read with profit (*Lancet*, 1925, ii, 10). Such was his interest in this subject that he became president of this section, as of the section for the study of disease in children.

Alton led the way, too, by looking after the children's minds. Writing at length with Dr. Evelyn Holmes on the evolution of hospital schools (*Lancet*, 1929, i, 789, 838) he emphasised once more the necessity for combining education with treatment, and pointed out that nearly 1% of children in elementary schools have crippling defects needing attention. For the adolescents at Alton he organised the college where the lads are taught a trade.

But Gauvain could not and did not neglect surgery. Three years after going to Alton he was describing in detail in this journal, from an already large experience, the mechanical treatment of spinal caries: and in 1913 he recommended the use of malleable jackets made from 'Celluloid,' rendered non-inflammable by admixture with calcium chloride. A useful sign of pathological activity in tuberculous disease of the hip-joint was noted in 1918 as follows:

> If the femur, on the affected side, be grasped firmly in the region of the condyles it will be found that the head of the bone may be gently rotated within the acetabulum, either inward or outward, through a varying but often considerable angle. When this movement is checked, but the disease remains active, a further slight sharp rotation is instantly followed by spasmodic muscular contraction, not confined to muscles about the joint but extending to the abdomen and visible in the abdominal muscles, or still more easily demonstrated if the palm of the hand is placed on the abdomen between the iliac spines. Quite a gentle and painless but sharp rotary movement is sufficient to provoke this reflex spasm of the abdominal muscles. Naturally, it would not be attempted where the disease is obviously active, but in just those cases where doubt exists I have found it a sign of the utmost value. With a little practice the sign is easily and safely obtained if the disease is active.

Nevertheless, it was as prophet and organiser that he did his greatest work. At Bart's he was known to have enterprise and staying-power, but no-one had quite suspected the vision that turned some hutments of the South African War into five up-to-date surgical units, joined by a terrace which was to become a show-piece for foreign visitors. "The conversion," writes E. C. M., "took the greater part of Gauvain's life and when in the course of it the supply of surgical tubercle began to run short this did not catch him out for there was poliomyelitis and the congenital dystrophies, and the sun-traps and perfect aeration were as suited to the essential needs of any childish ailment. And right in the middle of it all the City fathers who founded the hospital built themselves a little weekend cottage from which in the sundown of their own lives they could find comfort in the happiness they had created, or drive out in the summer to the Hayling annexe and watch the children splashing in the surf on the sand in the warmth of coke braziers, protected from the wind by hurdles. Thus rarely did a master mind work out over long years the vision of his youth."

Perhaps the biggest factor in the success achieved at Alton was the personality of the medical superintendent. He wanted to be friends with everybody, and everybody was delighted to be his friend. He was always cheerful and optimistic, and it was this attitude towards life which he managed to impart to others, so that it was diffused throughout the hospital. The happiness and optimism in the wards and various departments probably did as much as anything towards the cure of the patients. People visiting the hospital for the first time, and expecting to come away depressed, were amazed at the cheerfulness of everybody, particularly the patients, many of whom were lying flat on their back and had been doing so for many months. It is true that Gauvain was nobly seconded by his staff, particularly by two people who worked with him there for very many years; but it was his personality that dominated the place and created the atmosphere.

After the last war Gauvain, who had been knighted in 1920, spent much time in travelling and lecturing, and became indeed an ambassador of British surgery overseas, spreading the new doctrines of conservative treatment and heliotherapy. He could enliven a dull meeting, make a witty after-dinner speech, bring together the discordant elements in a committee and get things done. His persuasive personality was a great help in the period of hospital reconstruction and administration; for example, as chairman of the Joint Tuberculosis Council in its early days, he held together, in a masterly way, the county-council tuberculosis officials and the representatives of voluntary hospitals.

Gauvain's private hospital, the Morland Hall Clinics, gave him many opportunities for exercising his gener-

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osity, and since the early days of this war Belgian cripples evacuated from a hospital near Ostend have occupied most of the accommodation there—to the great satisfaction of the Belgian authorities. It was at Morland Hall that he was able to experiment with balconies for use in all weathers (*Lancet*, 1927, i, 755; 1933, i, 321). An open-air ward was early erected at King George's Sanatorium for Sailors at Bramshott, to which he was consulting surgeon, and proved its worth; and in the annual oration to the Medical Society of London in 1938 he was able to say of Alton:

> This hospital of my dreams is now completed. Doubtless in many ways it could be improved upon but I can truly say I am very content. It supplies at any rate what I consider the most urgent need of a modern hospital—properly designed and protected balcony accommodation. To appreciate that need one must have been a patient as well as a doctor. The advantage of getting into the open air away from the signs, sounds, and smells of the sick room must be experienced to be understood, and in my opinion it is a curative factor the importance of which is as yet insufficiently recognised.

Sir Henry Gauvain took the degree of master of surgery at Cambridge in 1918, and was elected FRCS in 1927. He was hon. consulting surgeon to the King Edward VII Welsh National Memorial and was formerly consulting surgeon for tuberculosis to the county councils of London, Essex, and Hampshire. He married in 1913 Louise, daughter of William Butler, IMS, and their only child (Mrs. R. O. Murray) is resident medical officer at Alton. He owned land in Alderney and was chairman of the Alderney Relief Committee. One of his last appearances in print was a letter to the *Times* on behalf of his distressed fellow-countrymen.

JAMES RICHARD WHITWELL

M B EDIN.

Dr. Whitwell, formerly superintendent of St. Audry's Hospital, and for many years hon. librarian of the Royal Medico-Psychological Association, belonged to a family owning land in Yorkshire, where there is a village of Whitwell. The son of a doctor, he was educated at Shrewsbury School and at Edinburgh, graduating with honours in 1887. After further study in Berlin and Vienna he became pathologist at the Wadsley Asylum, Sheffield, and then went to the West Riding Asylum at Menston near Leeds, as pathologist and second assistant medical officer. In 1892 he published the first description of the microscopical changes in the central nervous system in myxœdema. From the junior post at Menston he was, contrary to precedent, appointed superintendent of the Suffolk Mental Hospital at Melton. Conditions here were far from satisfactory; but by gradual removal of most of the former staff he wrought a great change and was able to do valuable pioneer work. Formerly every mental hospital was clearly labelled as such, and a new departure was made when Whitwell, with difficulty, persuaded his committee that their institution should henceforth be known simply as St. Audry's Hospital. The committee knew his value and supported him consistently; but the strain of administration told, and for a time he suffered from insomnia. After six months' holiday abroad he continued his work, but he was glad when the opportunity came to retire. Happily his last years were also fruitful. About 13 years ago he was appointed to look after the RMPA library which was then in poor condition, and he set himself to make it efficient. He greatly increased the number of journals circulated to members; he secured the best of the modern books; and he added by gift a number of interesting and ancient tomes. He enjoyed his work at the library and was able himself to publish three books—*Gleanings from Plato* (1935), *Historical Notes on Psychiatry* (1936), and *Syphilis in Earlier Days* (1940). Another work is, we believe, to appear posthumously.

A colleague writes: "Whitwell was a retiring man really. He had his own opinions and he stuck to them. He was erudite, and nothing pleased him more than making translations from the Greek or Latin. He was not an easy man to get on with; he was at times inclined to throw up everything if he did not have his own way, and he always resented authority. But he was straight and honourable. He was fond of good food (but sparing in that), and liked a good wine; he could tell a good story; and in his younger days he was quite a useful actor. Officially he was hard and firm, but he had the Yorkshireman's warm heart."

Dr. Whitwell's wise counsel will be missed not only by the RMPA, but by the Mental After-Care Association and the London committee of the Lebanon Hospital for Mental Diseases, in both of which he was keenly interested. He died in London on Jan. 9.

JAMES REID DICK

M B CAMB, F R C S E

By the death of Dr. J. Dick Reid, Scarborough has lost a doctor who had served the town and its hospital for over thirty years. As a scholar of Downing College, Cambridge, he took a second in the natural sciences tripos in 1906 and qualified from the London Hospital three years later. After holding house-appointments at the London itself, at the East London Hospital for Children, and at Great Ormond Street, he settled in Scarborough and his work there was interrupted only by the last war when he served in France and Italy. His friends of that time still recall "Richard" as a glutton for work. Work, indeed, was the main interest of his life. He was surgeon to the Scarborough Hospital, where "he not only slaved like a Trojan but did much good that was unseen and unknown." He was also medical officer to St. Martin's Home and the Scarborough Convalescent Home for Children. In his practice he gave his utmost both to his patients and his colleague. Golf, at which he excelled, was his one hobby, and for many years he was a popular captain of the Garton Golf Club. "Honesty was Dick's long suit," writes one of his partners, "his loyalty was unquestioned but never blind, and if he saw a fault he would try hard to remedy it. He was a fine practical surgeon, and his surgical acumen and judgment were equally high. He knew his own limitations and I have often known him refuse to operate when he thought a more experienced man would do better. A conservative in medical politics, he dreaded the prospect of political interference in medical freedom. He had a decisive mind and a good reason for every step he took."

Dr. Dick leaves a widow. His three sons are serving in the Forces.

THOMAS ROWLAND CHARLES WHIPHAM

D M OXFD, M R C P

Dr. T. R. C. Whipham, who died at Exeter on Jan. 20, aged 73, was educated at Rugby School and New College, Oxford. In 1895 he entered St. George's Hospital, where his father was senior physician, and he qualified in 1897, obtaining his BM in 1898. At St. George's Hospital, Dr. Whipham held the office of curator of the museum, and after a period as medical registrar there he was appointed physician to the Evelina Hospital for Children, and assistant physician and physician in charge of children at the Prince of Wales Hospital, Tottenham. In 1918 he gave up hospital and consulting practice in London, and retired to Devonshire, where his family had had associations for several generations. But he still maintained his interest in medicine, and by request acted as assistant physician to the Royal Devon and Exeter Hospital, consulting physician to the Exeter Dispensary and to the Exeter area of the Ministry of Pensions. His textbook on *The Medical Diseases of Children* appeared in 1915, and like all he wrote was notable for its lucidity, absence of padding, and exemplary English. Although somewhat deliberate in his approach to an examination, his opinion, founded upon extensive and patient work in the wards and post-mortem room, was consistently reliable, and with it went a happy way of imparting his views to others.

A lover of outdoor life, Dr. Whipham was a keen fisherman and gardener; but arthritis gradually caused him to relinquish all his activities, and since the onset of this war the effects of an acute illness had left him a confirmed invalid. But his mind remained clear up to the last, and he had always something of interest in store, from his wide reading, for those who visited him.

G. L. T.

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CECIL AUGUSTUS JOLL

M S LOND., CH M BRIST., F R C S

Cecil Joll, senior surgeon to the Royal Free Hospital, the Royal Cancer Hospital and the Miller Hospital, Greenwich, who died on Jan. 25 at the age of 59, had been ailing for six months, but he worked on until a fortnight before his death. His mastery of technique, combined with a wide knowledge of surgery, boundless energy, and an ability to express strong views in simple words, have left a deep impression at the many hospitals to which he was attached.

Lafayette

He was born in Bristol, the son of Mr. W. F. Joll, and read for his B Sc at Bristol University, where he won several scholarships and the committee's gold medal, graduating in 1905. At first he read dentistry as well as medicine, and he took his LDS in 1907. He did his preclinical work at University College, London, and spent his clinical years at the London Hospital. In the London MB examination he gained honours in four subjects and the university medal. He took his FRCS in 1910 and after a period of study in Paris became Master of Surgery at both London and Bristol. His interest in thyroid surgery began with his appointment as RMO at the Royal Free Hospital under Sir James Berry. During the last war he was a surgical specialist in the RAMC, and soon afterwards he was elected to the honorary staff of the Royal Free Hospital. There his tall immaculate figure, his correct frock-coat, and the carnation in his button-hole have become a tradition.

"As a colleague of his for twenty years," writes T. J. H., "I never ceased to marvel at the extraordinary amount of work he managed to do—and do well. He was most conscientious in carrying out his hospital duties. He never missed a hospital round or operation. Monday, which was his main operating day, was for years the high light of the Royal Free Hospital week. He seemed absolutely tireless and on one occasion, I believe, his operation list included ten thyroidectomies and a partial gastrectomy. He was also most punctilious in dealing with emergency operations and never failed to give his services any time, night or day. During the war years his hospital work was still further increased and throughout the blitz he slept in hospital every other night and alternate weekends. By hundreds of students, nurses, and patients he was universally beloved. He never failed to carve the Christmas turkey for his surgical wards and even managed to perform this function on his last Christmas day, though his health had by then seriously deteriorated.

"He was always the embodiment of cheerfulness and good fellowship, whether he was operating, attending various committees, or joining in convivial hospital gatherings. He was a lover of detail and disliked slovenliness in anything; hence his fastidiousness in dress."

Unusual dexterity, attention to detail, and choice of the simplest instruments combined to form Joll's superlative surgical technique. He rarely discussed a case at any length, but if questioned he would give a lucid dissertation on the disease and its surgical aspects, couched in the beautiful English of which he was a master. Apart from his contributions to thyroid surgery, which he brought together in his *Diseases of the Thyroid Gland* (1932), he was a general surgeon in the true sense, and it was his abdominal surgery which impressed his colleagues most. As a man he was difficult to understand on first acquaintance. "He had definite likes and dislikes, and could not suffer fools gladly; anything second-rate was anathema to him, and it was difficult to attain to his ideals. Once understood he was the best of friends, willing always to do his best for rich or poor at shortest notice."

Although surgery was his life's work Joll had many other interests—art, literature, music, travel and above all a love of nature. He was a keen and learned ornithologist, and R. H. G. recalls one occasion when he was operating in a theatre which looks out over the countryside. The case was intricate but in the middle of it he paused for a moment, and turning to the houseman asked, "What bird is that singing in the garden, my boy?" He alone of those present had heard the missel-thrush, and he urged his students to train their senses to note the common things in nature if they hoped to become observant clinicians. He loved good living and good fellowship, and as a host made everyone at his table feel an honoured guest.

In 1924 Cecil Joll married Laura Merriall Winsloe, of Frodsham, Cheshire, who died in 1931. He married again in 1936, his second wife being Antonia Ramsden, of London. He had a son by each marriage.

THE LATE SIR THOMAS BARLOW

Miss Harriette Chick, D SC, writes:—During the last war a group at the Lister Institute were engaged in a study of scurvy by experiments with guineapigs which had recently been shown by Holst and Frölich to suffer from a similar disease when fed upon a diet devoid of fresh vegetable matter. This work was undertaken in order to investigate the antiscorbutic value of various foods for application to army diets. At that time, in the early days of experimental work on vitamins, the view was common among clinicians that information regarding deficiency diseases produced in animals could not be applied to human subjects. Sir Thomas Barlow, however, who first described infantile scurvy, reacted otherwise. He made frequent visits to the institute to observe the results of the experiments, and gave great encouragement by his interest and appreciation of their significance.

A year or two later, the acid test was rendered possible when the same group of workers were investigating nutritional diseases in Vienna after the Great War. Under the incredulous eyes of the Austrian physicians the same substances which were found preventive and curative of guineapig scurvy were also found efficacious for treatment of infantile scurvy which was common in the city at that time. The disease was there known as Barlow's disease, pronounced "Barloff," as the delusion prevailed that the discoverer of the disorder was of Russian nationality.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED JAN. 20

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1564; whooping-cough, 1785; diphtheria, 518; paratyphoid, 1; typhoid, 11; measles (excluding rubella), 12,054; pneumonia (primary or influenzal), 1399; puerperal pyrexia, 137; cerebrospinal fever, 77; poliomyelitis, 9; polio-encephalitis, 1; encephalitis lethargica, 0; dysentery, 377; ophthalmia neonatorum, 51. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Jan. 17 was 974. During the previous week the following cases were admitted: scarlet fever, 45; diphtheria, 22; measles, 82; whooping-cough, 22.

Deaths.—In 126 great towns there were no deaths from enteric fever, 1 (0) from scarlet fever, 16 (0) from measles, 12 (1) from whooping-cough, 12 (0) from diphtheria, 50 (4) from diarrhœa and enteritis under two years, and 56 (6) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 3 fatal cases of whooping-cough. There were 5 deaths from diarrhœa at Birmingham, and 4 at Liverpool.

The number of stillbirths notified during the week was 221 (corresponding to a rate of 32 per thousand total births), including 16 in London.

ROYAL MEDICAL BENEVOLENT FUND.—The committee of management of the fund at its meeting on Jan. 24 expressed great regret at the death of its president, Sir Thomas Barlow. The income from subscriptions had risen steadily and showed an increase of £1752 over last year. The income from dividends had also slightly increased, and during the year £23,916 was received in legacies. The committee was glad to record that the encouraging state of the fund's finances had allowed them to deal more generously with those who applied for assistance.

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Notes and News

MEDICAL PROFESSION IN HOLLAND

THE course of the conflict between Dutch doctors and the Nazi authorities has been described by Major A. M. Meerloo in these columns (1943, i, 756). The Netherlands Government Information Bureau states that another open letter has now been addressed to the Reichskommissar, Seyss-Inquart, which though unsigned "is the voice of thousands of physicians." The letter complains that he has put the Dutch Red Cross in charge of a man who does not enjoy the confidence of the Dutch people, thereby making it a German instrument. It states that doctors consider the German government responsible for the increasing shortage of food, by which in the most densely populated districts adults receive only 600–800 calories a day. To this under-feeding, associated with shortage of fuel, cleaning materials, medical supplies, and disinfectants, is attributed an alarming increase in illness, including tuberculosis, dysentery, enteric diseases, and poliomyelitis; diphtheria and scarlet fever have reached alarming proportions, and the risk of typhus is serious. The occupying power is responsible because in contravention of international law it took away the huge reserve stocks of food lying in Holland in 1940 and because now, by confiscating means of transport, it prevents equal distribution of what remains. "The writers of this letter fear that considerations of humanity will be rejected by you . . . They cannot refrain, however, from reminding you that, at the time when German and Austrian children suffered from want, they received hospitality, clothing, and food in that same country which is now being plundered by your compatriots and being plunged into famine."

Attention is then drawn to the cruelty with which, again contrary to international law, Dutchmen are now being driven away like slaves and put to work in the German war organisation. Shocking examples are given of their treatment during transport and in work centres.

"Because of all this," the letter declares, "it becomes increasingly difficult for the Dutch doctors to maintain the humanitarian attitude . . . Dutch doctors have never, as long as their actions could be reconciled with their spiritual independence, refused to give the same attention to friend or foe. You will have to realise that, if you wish to make use of the services of the Dutch doctors in the future, such aid will only be given because of professional duty and because they would not like to be considered as being upon the same level as their opponents."

THE CASSEL HOSPITAL

THE distinguished record of the Cassel Hospital was originally based on the successful use of psychotherapy. T. A. Ross brought to this difficult and controversial field a balanced judgment and an honest desire to determine which methods of treatment yielded the most satisfactory results. Many physicians who regarded psychoanalysis and other psychological methods with great distrust felt no qualms when their patients went to the Cassel Hospital though it was well known that analytic methods were in use there.

In the current report by the present medical director the permanence of Ross's good results is attested. Dr. Rogerson remarks: "It has been the privilege of the present medical director to see a number of Ross's old patients who had at one time been suffering from severe neurosis. The stability which he had been able to give to these patients, who had often not seen him for many years, was truly remarkable, and it is difficult to see how it could greatly have been improved within the limits of the known techniques of psychotherapy."

Since then other methods have been introduced, which, because they use physical procedures, are sometimes thought to supersede psychological methods of treatment and to be more in keeping with the scientific outlook of modern medicine. Dr. Rogerson does not accept this view; neither does he refuse to employ these ways of shortening the duration of illness. Drugs such as barbiturates and nitrous oxide, or, in another context, insulin; electric-shock therapy; and even prefrontal leucotomy, are employed, along with the elucidation and analysis of emotional difficulties, and finally synthesis and rehabilitation.

Another aspect of the hospital's work has been the institution by Sir Felix Cassel of a fund to enable nurses to obtain a training in the care of neurotic illness. Bursaries are now available for matrons, sister-tutors, and ward sisters to get this additional experience, during an abridged four months' course, at the Cassel Hospital. Such an extension of the available facilities for the education of nurses in the psychological aspects of their work is a welcome step towards a more intimate association of the physical and the psychological aspects of health.

University of Cambridge

On Jan. 26 the following degrees were conferred:

MB, B Chir—J. D. Andrew, T. C. Beard, C. H. de Boer, *E. D. Dyson, *H. M. Giles, *P. R. Headley, *D. G. James, *E. D. Jones, *P. F. Lucas, *J. M. Morgan, *E. W. Nation, *D. A. Pond, *K. W. Symons, Jack Upsdell, *K. A. A. Wray, *E. L. Arnold, *W. M. Bennett, *I. J. Carré, *T. P. S. Frew, *P. F. Haggart, *J. G. Holmes, *J. D. S. Knight, *E. T. G. Meade-Waldo, *M. W. L. Mutch, *W. J. Naunton, *P. K. Robinson, J. M. Thomas, *D. P. Wheatley, *M. F. T. Yealland, *D. V. Bates, *J. H. E. Bergin, *W. R. Cole, *S. A. M. Garibian, *F. G. H. Hayhoe, *E. G. Jenner, *A. G. Leatham, *G. A. Newsholme, *G. H. Seale, *E. D. W. Tilleke, *R. A. Womersley.

B Chir—*R. O. Lee.

* By proxy.

University of Edinburgh

On Jan. 20 the following degrees and diplomas were conferred:

MD—*M. E. S. Harrison, A. S. Johnstone, and *J. B. Pennybacker (highly commended), I. F. MacKenzie, *E. G. L. Mark, *J. M. Matheson, *H. G. Triay.

D Sc.—J. N. Davidson.

MB, Ch B—D. F. Aitken, M. M. Andrew, Clifford Austin, A. D. Bethune, C. G. H. Bourhill, Henrietta M. Brand, R. B. Crombie, G. P. Debenham, T. F. Elias-Jones, I. S. Ferguson, J. C. Foster, M. I. Girdwood, C. G. I. Gordon, V. M. Guthrie, Jessie H. Ingram, D. M. Johns, F. R. C. Johnstone, James Lister, R. C. W. Lowe, P. S. Lurie, Ewen M'Ewen, Kenneth M'Lay, James M'Lelland, W. W. M'Phail, Reuben Mendick, A. G. Moffoot, *K. S. Mowatt, J. E. Norman, Joyce M. B. Orr, Patricia M. M. Paterson, Barbara Petrovskaia, Thomas Philip, K. H. S. Pottinger, †R. F. Robertson, †J. S. Robson, P. F. Scott, H. A. E. Simpson, Carol M. S. Spence, J. T. M. Stevenson, J. L. Stewart, B. J. I. S. Sutherland, R. W. Tonkin, J. G. Trimble, J. G. Waller, Melvin Wiederlight, E. A. M. Wood, A. D. C. Young.

**In absentia. † With honours.

DMR—Marcus M'Alley, Lesley I. Thomson, Colm Kelly, Margaret S. King, K. A. Mackenzie.

Royal College of Surgeons of England

At 3 PM on Thursday, Feb. 8, Sir Girling Ball will deliver the Bradshaw lecture on the end-results of treatment of growths of the bladder. On Wednesday, Feb. 14, at 3.30 PM, Prof. G. Grey Turner will give the Hunterian oration. His subject is to be the Hunterian museum—yesterday and tomorrow.

Royal College of Physicians of London

At a comitia held on Jan. 25 with Lord Moran, the president, in the chair it was announced that a committee was being set up to consider the problems arising out of demobilisation. A memorandum was received on the future organisation of the psychiatric services.

The following having satisfied the censors' board were elected to the membership:

J. F. Ackroyd, MB BRIST., *G. M. Barrett, MB CAMB., lieutenant RAMC, *M. P. Bhagat, MD BOMBAY, Georgiana M. Bonser, MD MANC., R. J. Cairns, MB LOND., *P. L. C. Carrier, MD LOND., lieut.-colonel RAMC, *L. B. Carruthers, MD KINGSTON, ONTARIO, *P. K. Chattopadhyay, MB CALCUTTA, *N. S. Clark, MB ABERD., major RAMC, *A. M. Dawes, MB LOND., captain RAMC, D. P. Degenhardt, MB EDIN., C. E. Dent, MB LOND., M. A. Floyer, MB CAMB., *R. H. Girdwood, MB EDIN., captain RAMC, Thomas Arthur Grimson, MB LOND., R. H. R. Hartley, LRCP, C. F. Hawkins, MB LOND., T. C. Highton, MB LPOOL, surgeon lieutenant RNVR, *J. C. Houston, MB LOND., captain RAMC, E. A. Hunter, MB LOND., M. R. Jeffrey, MB CAMB., A. T. Jones, MD LPOOL, *M. R. Joseph, MB SYDNEY, major RAMC, *A. C. Kendall, MB BIRM., captain RAMC, *H. S. Khandheria, MB BOMBAY, Herbert Levy, MD BERNE, G. M. Little, MB CAMB., Sidney Locket, LRCP, *Duncan Macaulay, MB GLASG., captain IAMC, *J. G. McGill, MD BELF., captain RAMC, W. A. Maclure, MB GLASG., surgeon lieutenant RNVR, William Mayer-Gross, MD HEIDELBERG, *J. K. Mehta, MD BOMBAY, *A. B. Mukerjee, MB CALCUTTA, J. M. Naish, MB CAMB., surgeon lieutenant RNVR, *M. J. Parsonage, MB MANC., captain RAMC, *Stewart Renfrew, MB GLASG., captain RAMC, *J. L. Reynolds, MB NZ, captain RAMC, *E. N. Rowlands, MD MANC., major RAMC, R. D. W. Schofield, MB LOND., *S. M. Shah, MB BOMBAY, E. G. Sita, MB CAMB., surgeon lieutenant RNVR, Josef Sondheimer, MB LOND., *Rathnavelu Subramaniam, MD MADRAS, G. I. M. Swyer, BM OXFD, Margaret D. Thompson, MB BIRM., R. D. Tonkin, MB LOND., flight-lieutenant RAF, *W. D. Wallace, MB SHEFF., captain RAMC, *Martin Ware, MB LOND., Captain RAMC, B. G. Wells, MB LOND., J. R. F. Williams, MB LOND., and *A. W. Woodruff, MD DURH., squadron-leader RAF.

* Admitted in absentia.

Licences to practise were conferred upon the following 125 candidates (106 men and 19 women) who have passed the final examination of the Conjoint Board and have complied with the by-laws of the college:

Hildegard C. Abraham, R. A. Allan, Alison H. C. Alwyn-Smith, Richard Andrew, E. A. Balls, W. A. D. Barwise, M. A. Bernays, A. E. Bernstien, K. A. Bhagan, F. J. A. H. Blackwood, R. A. Boland, Daphne V. Bousfield, R. G. L. Brittain, B. H. Brock, A. S. V.

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Burgen, J. S. Campbell, R. J. F. Campbell, A. A. Cohen, D. H. P. Cope, H. J. P. Davies, Margaret E. Davies, Roger De Vere, Denis Dooley, E. J. Dowling, J. M. Drew, M. W. Eddings, K. A. Elliott, Thomas Ellis, Edith M. Evans, T. A. Evershed, R. C. Farrow, Ruth M. Fawcett, N. R. Fenton, W. N. Fitzpatrick, M. W. Fordham, W. P. Foster, A. T. H. Glanvill, F. J. Goodey, M. V. Guilmant, K. J. Gurling, John Harding Cox, Mary L. Hare, J. E. Holgate, J. G. Holmes, E. H. Hopkinson, Dorothy I. Howes, Mary P. Hughes, M. F. Hunt, Flavia Z. L. B. James, R. M. Jenner, Moyra P. C. Johnsen, E. D. Jones, Sydney Jones, I. M. Kahan, A. P. Kalra, W. de M. Kellock, D. R. Laurence, Sidney Levine, D. O. Lloyd, H. R. Lomax, Margaret D. T. Lord, G. E. Luke, R. P. C. MacDonald, Kathleen M. M. McDougall, J. R. Macintyre, C. B. McKerrow, Donald MacKinnon, Nora S. McRaith, H. B. Marsden, J. D. Martin, Seymour Mason, Geoffrey Mizbah, M. G. Moore, A. V. Morse, E. W. Nation, G. F. Newbold, D R. L. Newton, D. P. Nicholson, T. M. Nott-Bower, P. R. Ormrod, G. P. Oxborrow, Geoffrey Pollitt, Jean P. Popple, R. W. Povey, T. H. Powell, I. H. Pratt, J. M. Reed, A. P. Roberts, J. M. Roberts, J. H. Robinson, G. J. Romanes, G. A. Rundle, E. L. N. S. Sack, R. G. H. Salkeld, A. O. Sankey, Herbert Schwarz, M. G. Scott, Elizabeth M. Sefton, James Sharp, A. F. Sheldon, D. W. S. Sheldon, C. B. Sherer, J. P. Shillingford, Solomon Shubsachs, D. B. Spanton, John Stafford, G. W. Storey, H. D. Symon, S. D. Tejani, A. E. Thomas, Betty Thomas, J. L. Thomas, N. A. Thorne, Christopher Todd, George Twynholm-Mason, V. M. N. Usborne, P. H. Vernon, Paul Watson, Percy Weinstein, D. P. Wheatley, P. J. Wilkinson, Olwen D. Williams, D. H. Woodhead, M. F. T. Yealland, and George Yerbury.

Diplomas in public health, psychological medicine, and laryngology and otology were conferred on those named in the report of the Royal College of Surgeons in our issue of Jan. 20 (p. 102). The following diplomas were also conferred jointly with the Royal College of Surgeons:

DCH.—A. D. Barlow, T. E. D. Beavan, Joyce L. Chamberlain, Helen Davidson, Mary D. Dixon, Margaret Edge, Agnes J. M. Gilruth, Muriel C. Goodchild, Jean L. Hallum, Elizabeth Hoffa, R. F. Hollick, G. A. James, P. A. Jennings, L. S. Leveson, R. I. Mackay, H. E. Pollak, Millicent M. Rogerson, Leonard Sagorin, Sheila F. Schofield, D. J. Thomas, C. D. Thornley, P. G. Todd, H. G. Triay, Peggy O. M. Tyson, and David Weiner.

DA.—J. D. Blair, Victoria M. Brown, J. S. Calnan, M. V. H. Denton, Cecile P. Fellows, E. K. Gardner, Marion W. S. Green, J. L. Griffin, Ronald Peters, Edith Rhodes, Martin Rushton, T. A. Turnbull, Douglas Wilson, Edith Winternitz, Violet B. Young, and A. H. Zair.

Royal College of Obstetricians and Gynæcologists

At a meeting of the council held on Jan. 27, with Mr. Eardley Holland, the president, in the chair, the following were elected to the membership:

Amelia E. Burch, J. P. O. Erskine, Eric Garland-Collins, A. B. Hay, Jadwiga Karnicki, Gladys E. Keith, Dorothea M. Kerslake, Sybil G. Mocatta, Dorothy M. Shotton, B. G. G. Spiers, Dorothy J. Thompson.

Association of Municipal Specialists

At the inaugural meeting held on Jan. 19, at County Hall, London, with Dr. H. Joules in the chair, more than 100 attended and the following appointments were made:

Officers—President, Dr. H. Joules; treasurer, Dr. B. Barling; secretary, Mr. G. F. Stebbing.

Council—Dr. C. A. Birch, Mr. T. G. I. James, Dr. J. E. McCartney, Dr. J. N. O'Reilly, Mr. P. V. Reading, Mr. D. W. Stern, Mr. Wentworth Taylor, Mr. Rufus Thomas, Dr. J. Duncan White, Mr. S. W. Wright.

The secretary may be addressed at 12, Manchester Square, London, W1.

Pharmaceutical Society of Great Britain

At 7 PM, on Thursday, Feb. 8, at 17, Bloomsbury Square, London, WC1, Dr. S. A. Sarkisov, professor of neuropathology at the Moscow Institute of the Brain, and representative in Great Britain of the Red Cross and Red Crescent of the USSR, will speak on the health services of the Soviet Union.

Royal Medico-Psychological Association

The next quarterly meeting will be held on Wednesday, Feb. 7, at 10.30 AM at 11, Chandos Street, London, W1. The subject of discussion will be electro-encephalography in relation to psychiatry. Papers will be read by Dr. Denis Hill, Dr. R. Sessions Hodge, and Mr. W. Grey Walter.

Royal Institute of Public Health and Hygiene

During February and March on Wednesdays, at 3.30 PM, the following lectures will be given: Surgeon Rear-Admiral G. Gordon-Taylor, surgery and Russia (Feb. 7); Dr. G. H. Newns, infant mortality (Feb. 14); Dr. I. H. MacLean, whooping-cough immunisation (Feb. 21); Dr. Harold Balme, the place of rehabilitation in hospital service (Feb. 28); Lord Forrester, FIIA, industry and its environment—physical and social (March 7); Mr. V. Zachary Cope, surgery in the life of today (March 14); Dr. Janet Aitken, rheumatism in children (March 21); and Mr. Frederick Pratt, obstructive abdominal conditions in infancy (March 28). All the lectures will be held at the institute, 28, Portland Place, London, W1.

Medical Society of the LCC Service

A meeting of this new society will be held at Paddington Hospital, Harrow Road, W2, on Wednesday, Feb. 7, at 2.30 PM, when members of the staff of Paddington and St. Charles Hospitals will demonstrate cases.

Royal Society of Medicine

There will be a general meeting of the society on Tuesday, Feb. 6, at 4.30 PM. At the same hour the section of orthopædics will discuss unilateral osteo-arthritis of the hip-joint. The openers are to be Mr. G. R. Girdlestone, Mr. R. Watson-Jones, Mr. Bryan McFarland, Mr. J. B. Pennybacker, Mr. T. T. Stamm, and Mr. Kenneth Pridie. On Feb. 7, at 2.30 PM, Prof. S. Lyle Cummins will read a paper to the section of history of medicine on Auenbrugger and Laennec. On the same day at 5 PM the sections of surgery and proctology will hold a joint meeting when Mr. Rodney Maingot, Dr. Cuthbert Dukes, and Mr. O. V. Lloyd Davies will open a discussion on carcinoma of the colon. At the section of ophthalmology on Thursday, Feb. 8, at 5 PM, short papers will be read, and afterwards Mr. T. M. Tyrrell will show a film on dacryocystorhinostomy.

Appointments

BLAIR, L. G., MRCS, DMRE: temp. director, radiology department, Brompton Hospital, London.

CRESWELL, H. E., MB CAMB.: examining factory surgeon for Milborne Port, Somerset.

EVANS, G. H., MB CAMB.: examining factory surgeon for Pontypridd, Glam.

LOUDON, P. S., MRCS: temp. asst. surgeon at Kent County Hospital, Sheppey.

MORGAN, T. K., MB LOND.: asst. radiotherapist, Royal South Hants and Southampton Hospital.

YATES, A. G., MD EDIN., FRCP: medical referee for Doncaster, East Retford, Mansfield, and Worksop county-court districts.

The Colonial Service announces the following appointments:

MCSORLEY, J. G. A., MB NUI, MO, Nigeria;

JOHNSTONE, F. J. C., MD EDIN., DPH, DTM, DMS, Gold Coast.

BRANDAY, W. J., MRCS, MPH JOHNS HOPKINS, ADMS (Hospital and Personnel), Jamaica.

Births, Marriages, and Deaths

BIRTHS

ATKINS.—On Jan. 20, the wife of Flight-Lieutenant John B. Atkins, BM—a daughter.

BENNETT.—On Jan. 24, in London, to Dr. Margaret Bennett (*née* Allchin), wife of Mr. H. W. D. Bennett—a son.

BUTCHER.—On Jan. 23, at Bromhead, the wife of Dr. H. G. H. Butcher, Branston Hall Sanatorium, Lincoln—a son.

ELLIS.—On Dec. 30, at Palmers Green, the wife of Lieut. J. Williams Ellis, RAMC—a son.

HAMILTON.—On Jan. 24, at Parkstone, Dorset, the wife of Surgeon Lieut.-Commander S. G. Hamilton, RNVR—a son.

JEFFERISS.—On Jan. 20, in London, the wife of Dr. F. J. G. Jefferiss—a son.

STARKIE.—On Jan. 22, at Northampton, the wife of Dr. E. T. W. Starkie—a daughter.

TURGILL—On Jan. 22 at Gerrards Cross, the wife of Flight-Lieutenant Leslie Turgill, RAFVR—a daughter.

YOUNG.—On Jan. 23, at Exeter, the wife of Dr. B. A. Young—a son.

MARRIAGES

FIGGIS—HARGREAVES.—On Jan. 27, at Harrow-on-the-Hill, Morton Milnes Figgis, captain RAMC, to Jean Mary Hargreaves.

JACKSON—MARTIN.—On Jan. 24, in London, Gerald Christopher Arden Jackson, captain RAMC, to M. Honor Martin, junior commander ATS.

PATERSON—DALWICK.—On Jan. 20, at Bournemouth, Harold Rose Paterson, major RAMC, to Alys Emalie Dalwick (*née* Hersey).

WILSON—MACDONALD.—On Jan. 24, in London, Lieut.-Colonel D. A. O. Wilson, RAMC, to Mrs. Macdonald (*née* Goodban), widow of Lieut.-Colonel Angus Macdonald, RAMC.

WOOD—WILLIAMS.—On Jan. 13, at Barwell, James Willoughby Wood, surgeon lieut.-commander RNVR, to Mary Elizabeth Grant Williams, WRNS.

DEATHS

COLLINSON.—On Jan. 25, at Linton, Wetherby, Yorks, Harold Collinson, CB, CMG, DSO, MS LOND., FRCS, aged 68.

COTTERILL—On Jan. 21, in London, Leonard Cotterill, MB ABERD., lieut.-colonel RAMC, aged 75.

GREEN.—On Jan. 22, Alan Baldrey Green, MA, MD CAMB., of Acton Castle, Perranuthnoe, Cornwall, late bacteriologist i/c antivariolous vaccine department, Lister Institute, London.

HAMILTON.—On Jan. 24, at Cambridge, David Livingston Hamilton, FRCSE, late lieut.-colonel RAMC, T, formerly of Dover.

JOLL.—On Jan. 25, in London, Cecil Augustus Joll, MS, B SC LOND., MD BRIST. FRCS, aged 59.

SMALLEY.—On Jan. 25, at Hove, Sir Herbert Smalley, MD DURH., aged 93.

WEST.—On Jan. 26, at Hoddesdon, Hertfordshire, Leonard West, MB EDIN., JP.

WILKINSON.—On Jan. 21 at Poynton, Cheshire, Arthur Thomas Wilkinson, MD LOND., FRCP, aged 91.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

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INGUINAL HERNIA

THE HOUSE THAT BASSINI BUILT

W. J. M. BRANDON, F.R.C.S.E.
LIEUT.-COLONEL R.A.M.C.

A SURVEY of the published work on inguinal hernia reveals three fundamental facts—that most of it is either conscious or unconscious reiteration; that a good deal of it is dictated by the fashion of the moment; and that at the present rate of progress the course will continue to be lapped indefinitely. "These gallant words which seem so novel to those that speak them were said in accents scarcely changed a hundred times before. The pendulum swings backwards and forwards. The circle is ever travelled anew." (W. S. Maugham.)

The current phase in the treatment of inguinal hernia might well be described as the "Ogilvie phase." In other words, simple excision of the sac has become a standard method of repair for the uncomplicated type of oblique hernia, the Bassini has been relegated to the museum, and the reconstruction of the inguinal canal for direct and large oblique hernia has been left to the devices of the "Old Gang"—the Halsted, the Bloodgood, the McArthur, the Gallie, the silk-lattice repair, and their innumerable modifications. These methods have failed in the past, and there seems little reason to believe that they will not continue to do so in the future, but this troublesome aspect of the problem is happily surmounted by inferring that the world has been populated by a high proportion of incompetent surgeons.

An assessment of the recurrence-rate of inguinal hernia is equally conducive to a migraine. The only point on which there appears to be any unanimity is the interval between operation and recurrence. Most authorities agree that about 70% of recurrences take place during the first 12 months and that 90% have recurred by the end of the second year. For the rest, the figures given for recurrence depend on either personal experiences suggestive of the most incredible good fortune, or on statistical reviews handicapped at the outset by an inadequate knowledge of the severity of the herniæ, the type of operation, or the technical ability of the surgeons involved. No estimate of the recurrence-rate can have any practical value unless these points have been examined most carefully, and above all the review must embrace individuals exposed to strain such as members of the Armed Forces or of the Metropolitan Police; for repairs which are adequate for sedentary or semi-sedentary occupations will not always withstand the stresses of active service. A true computation of the results of war-time inguinal hernia surgery is not yet available, but A. G. McPherson (see Page 1942) has worked out the following series of recurrences from operations performed on Metropolitan Police personnel at St. Thomas's Hospital.

Operation	*No.*	*Recurrences*	*Recurrence-rate %*
1. Excision of sac only ..	86	8	9·3
2. Fascia lata repair ..	39	6	15·4
3. Other methods (Bassini, Fowler, McArthur, Bloodgood)	17	3	17·6
Total	142	17	12·0

Though this series is small, the figures indicate the rate of recurrence which may be expected with competent surgery and show that the fascia lata repair has no striking advantage over other operations. This impression is supported by a wider review.

For practical purposes it can be assumed that simple excision of the sac offers the greatest chance of success provided the cases are suitably chosen, and that nearly all the operations designed for the reconstruction of the inguinal canal succeed or fail with about equal regularity. Various reasons have been advanced for this persistent failure, such as the wrong choice of operation, poor surgical technique, the wrong type of suture material, the age or poor physique of the patient, insufficient postoperative care, sepsis, and the Bassini operation. I do not propose to bore the reader with a rehash of the source of interminable discussion on these points; instead, I shall employ a simple parable.

The house that Bassini built.—Once upon a time a man called Bassini built a beautiful house on the side of a hill. It soon became the envy and admiration of everyone, but for some reason this house kept falling down and had to be rebuilt over and over again.

Now Bassini was a very popular man, and he suffered from no lack of helpful advisers. Some of his brother architects reinforced the walls for him; some introduced new and indestructible materials; some redesigned the house completely, making the plan so complicated that the onlookers were unable to understand it and naturally considered it a great advance; a few rebuilt it from within outwards, working on the principle that if a house is built the hard way it will be harder for it to fall down; while the rest paid little attention to the designs of the master-builders, and were thus able to produce new and original methods in enormous quantities. But to the amazement of everyone the house continued to fall down, though on one occasion it stayed up for a whole day longer.

As time went on a great many people became interested in this house because there were a lot of houses to be built and it seemed only right that a house should last its owner his lifetime. But the onlookers were confused by the dissension among the builders, and still more by a curious blindness that seemed to affect them. Each group were unable to see the ruins of their own house, however often it fell down, yet when others failed with the same design they decided that the workmanship must have been bad, and offered correspondence courses on how it ought to be done.

Then a wise man called Ogilvie remembered that his great-grandfather once built a little shack on the side of a hill, because large houses could not be built in those days. He came to the conclusion that, if a man must live on the side of a hill, and can live alone, the lighter he makes his house the less likely will it be to fall down or slide into the valley. He backed his opinion with such lucid and logical arguments that it took only ten years for the other builders to realise what he was driving at. But once this fact was grasped, everyone became happy and there were great rejoicings till they remembered that this kind of house would not do for a man with a large family. At this stage it became necessary to add a new wing to the local library.

Now about this time a certain simple fellow, who had rebuilt his own house many times with no-one to help him, viewed this strife from afar and then pondered over it as follows: "Strengthening the walls does not stop a house falling down; binding them with indestructible materials does not seem to help; even silver spires do no more than improve its appearance; and I cannot see how learned discussions on the merits of the different kinds of mortar and cement have affected the result. If a house persists in falling down in spite of having immensely strong walls, it can only mean that no-one has examined the foundations with sufficient care." So he proceeded to do so. And the result of his work is recorded in these pages.

Why Inguinal Herniæ Recur

Any attempt at an explanation of recurrences after operative repair must take into account the methods of operation, the types of hernia for which they are performed, and the way in which they fail. For the sake of simplicity I propose to follow the plan laid down by Ogilvie (1937a, b, c, 1938), dealing as briefly as possible with those aspects of the subject he has covered so adequately:

1. The standard operation for congenital hernia with good muscles.
2. Modifications of the standard operation for acquired or old-standing congenital hernia where the internal ring has become stretched but the muscles are still good.
3. Operations for direct and large oblique herniæ.

Group 1: Standard operation for congenital hernia with good muscles.—Ogilvie's description of the anatomy and muscular mechanism of the inguinal canal leaves little doubt "that removal of the sac alone is not only a sufficient operation but the surest safeguard against recurrence." We find in practice that this is true; this operation gives far and away the lowest rate of recurrence. When a recurrence does take place the

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sac is an oblique one and has resulted from a technical error on the part of the surgeon. He has either failed to ligate the sac at the neck or has applied the operation to a hernial sac which is more than half an inch in width at the neck, when flattened across the examining finger, thereby leaving a lax internal ring.

Group 2. *Modifications of the standard operation.*—(*a*) *For old-standing congenital hernia*, where the muscles are still good but the margins of the internal ring have been stretched: In this type of hernia removal of the sac with repair of the torn or stretched transversalis fascia again offers the most logical method of treatment. The internal ring has been reconstituted to its normal size and the muscles which are still efficient will now be able to protect it. If a recurrence takes place the sac is an oblique one, and results from the application of this method to hernial sacs which are greater than an inch in width at the neck or from a misjudgment as to the efficiency of the muscles.

(*b*) *Acquired oblique hernia*: Ogilvie has described this type of hernia so clearly that few surgeons should fail to distinguish it from the congenital type. Here the modified type of repair for acquired oblique hernia cannot be applied with the same certainty of success. The hernial sac, we are told, "has its origin in a prolapse of the cord due to the combined influence of poor muscles and repeated straining" (Ogilvie). In other words, the recoil mechanism of the cremaster has become defective. We find at operation on this type of case that the cremaster is invariably thinned out and sometimes almost non-existent. If it is assumed—and there is no evidence to the contrary—that the transversalis fascia was intact originally, how can a patched-up transversalis fascia fare any better? Particularly as the efficiency of the muscular mechanism has in no wise been enhanced by the operation. Whatever the explanation may be for the formation of any acquired hernia, there is a world of difference between a muscular mechanism which cannot cope with a preformed sac and one which cannot prevent the formation of a sac. Therefore all oblique hernial sacs that are relatively short, wide-necked, and thick-walled, and are easily separated from the surrounding structures and lie outside the infundibuliform fascia, should be treated by a reconstruction of the inguinal canal. I have found that this is the type of hernia that lets the side down.

Group 3. *Operations for large oblique and direct hernia.* (*Reconstruction of the inguinal canal.*)—Much of the confusion in the treatment of inguinal hernia has resulted from lumping these two conditions together and treating them as a single complaint. Large oblique and direct inguinal herniæ are two distinct clinical entities and must be treated as such.

(A) LARGE OBLIQUE HERNIA

In this group we are compelled to replace nature's active muscular control of the inguinal canal by a passive channel which must allow unimpeded passage to the spermatic cord but at the same time discourage the insinuating appeal of the hernial sac for an equal right of way. On an average about 15–20% of these cases recur, no matter what method of repair is employed and no matter what degree of approbation any one of them may receive from its author or his supporters. But the fact that about 80% are successful proves that a permanent repair by means of a passive channel is by no means impossible. Edwards (1943) and Capper analysed 131 cases of recurrent hernia in men of military age and concluded that 75% were external oblique (indirect) recurrences, the new sac passing through the internal ring in association with the cord. The remainder were direct, and these were of two types: (*a*) a diffuse bulge, with a saucer-shaped sac (15%), and (*b*) a funicular sac coming through a well-defined opening in the transversalis fascia just lateral to the outer border of the insertion of the conjoined tendon (10%). I am not sure whether this series included recurrences from simple herniotomy and direct herniæ, but I have quoted the figures because they give the proportionate recurrence-rate that I have observed at operation on recurrences from oblique inguinal hernia. In other words, oblique recurrences are far more common than the direct type, or, as Edwards puts it, "the original hernia is reproduced."

Any investigation into the causes of recurrence after reconstruction of the inguinal canal for large oblique hernia should take into account the mechanism by which the recurrence has been produced and the type of sac we should expect in the circumstances. If we compare these findings with the conditions that obtain at operation on recurrent herniæ and find they are identical, we may assume that there is some truth in the hypothesis. For this investigation I propose to use the Bassini repair, first, because it is well known, and secondly, because it reproduces all three types of recurrences. Since this operation is the prototype of all the posterior repair operations it will serve to show why they too suffer from the same potential weakness at the internal ring, and why, in turn, the anterior repair operations are even more prone to the oblique recurrence.

Direct recurrences.—(i) *The diffuse bulge* is the most popularly accepted type of recurrence and has been handed down from textbook to textbook and from article to article until it has become a tradition. It accounts for about 15% of recurrences, and is due to the cutting-out of the holding sutures and the return of the conjoined tendon to its former position soon after the primary repair. In nearly every case it is the result of excessive and *continuous* tension on the holding sutures, which produces a localised necrosis and an early cutting out of these sutures, before the conjoined tendon has become firmly adherent to the inguinal ligament. There are three well-known causes for this excessive tension—(1) the attempted suture of a high-arching, poorly developed conjoined tendon to Poupart's ligament; (2) an inability to distinguish the point at which the free margin of the conjoined tendon merges into the cremaster, so that a portion of the tendon is brought down which cannot be approximated to Poupart's ligament, except under tension; and (3) simply tying the holding sutures too tightly. If the damage to the conjoined tendon has been excessive, it can no longer close down on Poupart's ligament during active contraction. Thus it can be readily understood that a direct hernia is liable to occur.

(ii) *The funicular sac of Ogilvie* was first described by him in 1937. Capper, according to Edwards, states that it accounts for about 0·6% of primary herniæ. But when it occurs as a recurrent hernia its incidence is much higher and is due to faulty technique at the primary operation. In the normal way the cord acts as a "cushion" at the base of Hesselbach's triangle, supporting and protecting the transversalis fascia against the outward thrust of intra-abdominal strain. In the case of a healthy well-functioning inguinal muscular mechanism, the outward thrust of the intra-abdominal pressure in this area is at right angles to the canal and its contents. Protection is obtained by a tautening of the external oblique aponeurosis and the interposition of the conjoined tendon between this structure and the cord. Therefore any outward thrust against the transversalis fascia is imparted first to the cord in a cross-sectional direction and is then absorbed by the contracted conjoined tendon and the tautened external oblique aponeurosis. The cord, by virtue of its position and bulk, must absorb a certain amount of these counteracting forces, so that it must have as near a "cushioning" action as makes no odds. In the Bassini operation, the cord is separated from the underlying transversalis fascia and placed in front of the conjoined tendon. Therefore, unless the conjoined tendon is sutured down carefully to Poupart's ligament right up to the pubic spine, a small defect remains in the posterior wall near the outlet of the canal which is often missed because it is hidden by the posterior fibres of the cremaster or by tags of fatty tissue and must be felt for in every case by the examining finger. If this defect is not closed completely a short straight channel is left at the lower end of the canal, covered at its proximal end by unsupported transversalis fascia as it sweeps medially from the posterior surface of the sutured portion of the conjoined tendon to pass behind the deeper lying insertion of the conjoined tendon into the pectineal line (fig. 1). The transversalis fascia in this region is relatively thin, and any intra-abdominal straining may rupture it, allowing the passage of a small funicular sac down the channel to emerge with the cord at the external ring (fig. 2). It will follow that failure to close the posterior wall right down to the pubic spine, in any of

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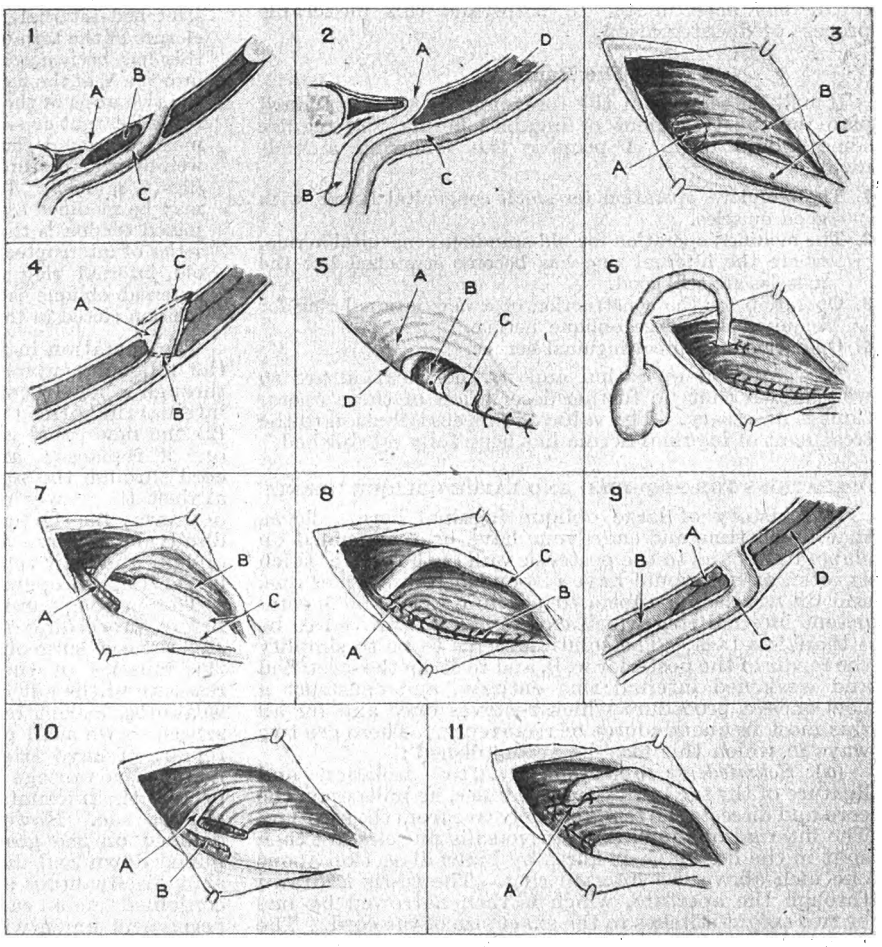
the other methods of repair, is likely to result in a similar recurrence, and that failure to reconstruct a stretched external ring will facilitate the process.

Oblique recurrences account for about 75% of inguinal hernia recurrences. They rarely, if ever, emerge through the external ring. The sac tends to be thin-walled, wide-necked, relatively short, and somewhat irregular in shape. So they all have the appearance of a diffuse bulge and could be readily mistaken for direct herniæ but for the fact that the internal ring is always involved. The frequency of this recurrence is due to one factor alone: *that the true internal ring is overlapped completely by the lower border of the internal oblique muscle.* In consequence closure of the so-called internal ring at operation does not occur at the true internal ring but at a point about ½–¾ inch lower down along the cord (figs. 3 and 4). It is true that the transversalis muscle which lies on a deeper plane is sutured as well. But since this muscle rises from Poupart's ligament to the lateral side of the point of emergence of the cord through the transversalis fascia and is sutured to Poupart's ligament at the same point as the internal oblique—i.e., as part of the conjoined tendon—the closure is by no means a well-fitting one. If this repair were viewed from inside the abdomen, it would be observed that a short conical funnel has been formed, with its wider opening or base at the true internal ring and its apex at the outlet into the inguinal canal (fig. 5). This funnel is occupied by the cord which only fits it accurately at the apex; so it will seem that this leaves an unprotected space exactly opposite the true internal ring, which allows just sufficient room and leeway, in a proportion of cases, for the piston-like thrust of the intra-abdominal tension to form a new sac. Once this has occurred repeated straining will sooner or later force the sac through the apex of the funnel into the inguinal canal in association with the cord. At first the ring stretches, but later as the neck of the sac increases in diameter the ring breaks down at the expense of the posterior wall of the canal, leaving a large direct communication with the peritoneal cavity. The shape of the new sac depends entirely on the time factor and the degree of fibrous-tissue reaction within the canal. If the recurrence takes place early—that is, before the canal and its contents become firmly fused by organised fibrous-tissue adhesions, or (and this is the unkindest cut of all) if the primary repair has been carried out with such care and gentleness that there is comparatively little fibrous-tissue reaction—the fundus of the new sac will meet comparatively little resistance and will burrow its way down the canal as a fusiform sac which is almost the exact replica of the original one. If however the sac enters the canal later, when the fibrous adhesions with the canal have become fully organised, the fundus of the sac cannot proceed along the canal in the usual manner and is sooner or later brought to a halt before it can reach the external ring. Continued intra-abdominal strain can now only exert lateral pressure on the walls of the sac with a consequent widening of its neck and lumen. Since the process of fibrosis within the canal is unlikely to be of uniform strength throughout, the sac will spread in the planes of least resistance, resulting in the wide-necked irregular sac so often seen at operation on recurrent inguinal hernia.

Recurrences in the "Old Gang" series.—(*a*) *Posterior repair operations:* The repairs attributed to McArthur, Bloodgood, Willys Andrews, Gallie, and the silk-lattice repairs are all modifications of the Bassini, and differ only in that the suture of the conjoined tendon to Poupart's ligament behind the cord is carried out and reinforced by strips of external oblique aponeurosis, fascial flaps derived from various sources, strips of fascia lata, or strands of floss-silk. In theory they are superior to the Bassini, but in practice each one of them suffers from the same potential weakness at the internal ring, for exactly the same reason, the only two exceptions being Schmieden's operation and Ogilvie's silk-lattice repair. The artificially constructed internal ring in these modifications is on the whole tougher, more durable, and less liable to stretching—at least during the earlier months after operation. But a statistical review of their respective recurrence-rates reveals that they are almost on a par with that of the Bassini. The nearest analogy that occurs to me at the moment is that



1.—*A.* Defect in posterior wall due to incomplete closure of conjoined tendon to Poupart's ligament right up to the pubic spine. *B.* Posterior repair. *C.* Spermatic cord.
2.—*A.* Point of rupture of transversalis fascia and neck of sac. *B.* Funicular sac. *C.* Spermatic cord. *D.* Posterior repair.
3.—*A.* Position of internal ring. *B.* Internal oblique muscle. *C.* Spermatic cord.
4.—*A.* Potential space which allows the formation of a new sac. *B.* Site of repair of muscular internal ring seen at operation and apex of cone. *C.* Conical shape of muscular internal ring shown by dotted lines.
5.—View from inside abdomen. *A.* Transversalis muscle. *B.* Internal oblique muscle. *C.* Apex of cone—point of emergence of cord into inguinal canal (cord omitted). *D.* Inguinal ligament.
6.—Schmieden's operation (after Ogilvie).
7.—*A.* Incision of internal oblique and transversalis muscles. *B.* Conjoined tendon. *C.* Cremaster.
8.—*A.* Incised muscles reconstituted forming a new muscular internal ring. *B.* Entire inguinal canal closed by suture of conjoined tendon to Poupart's ligament. *C.* Spermatic cord.
9.—*A.* Portions of internal oblique and transversalis muscles sutured medial to the cord. *B.* Conjoined tendon. *C.* Spermatic cord emerging through a well-fitting muscular internal ring. *D.* Internal oblique and transversalis muscles.
10.—*A.* Point of separation of internal oblique and transversalis muscles in the line of their fibres. *B.* Muscle incised. Spermatic cord omitted.
11.—*A.* New internal ring fully reconstructed.

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of a man whose feet and left arm are lashed securely but whose right arm is loosely tied. Few would show surprise at his eventual escape, yet this is the principle adopted for the treatment of large oblique hernia.

(b) *Anterior repair operations:* If the above hypothesis is correct, it will be seen that the anterior repair operations, such as the Halsted, Fergusson, and allied methods, are even more prone to this oblique type of recurrence. This potential weakness at the internal ring is much more evident; the new hernial sac is permitted to extend down almost as far as the external ring before it meets its first obstruction. Thereafter it has a short, almost straight, tunnel to negotiate, which must be just pie to this Houdini-like structure now in the pink of condition.

(B) DIRECT HERNIA

The direct hernia presents an entirely different problem. Here we are fighting a losing battle against progressive atrophy of both the muscles and the fascial layers in the region of the inguinal canal. The structures gradually stretch as the result of repeated strain, and a diffuse saucer-shaped sac appears in the inguinal region. If a recurrence takes place, it is again a diffuse bulge of the direct hernia type and means that the primary repair has been unable to withstand this inexorable process of disintegration.

The Remedy

It will be seen from the foregoing that the standard plan for the treatment of inguinal hernia will require some modification. I propose the following amendment—

1. The standard operation for small congenital hernia with good muscles.
2. The modified operation for old-standing congenital hernia, where the internal ring has become stretched but the muscles are still good.
3. Operation for the construction of a new internal ring for acquired and large oblique herniæ.
4. Operations for direct inguinal herniæ.

The standard operation and its modification are so well known that no further description of these operations is necessary. The value of this contribution to the treatment of inguinal hernia has been fully established.

OPERATIONS FOR ACQUIRED AND LARGE OBLIQUE HERNIÆ

The history of large oblique inguinal hernia shows that much time and endeavour have been expended on elaborate repairs to the posterior wall of the canal, which as often as not would have responded to a simpler one, and on wearisome efforts to patch a worn and incompetent internal ring which experience has proved to be a thankless task. The solution seems to be to simplify the repair of the posterior wall, and to scrap the stretched and weakened internal ring entirely, and construct a new one—a procedure which removes once and for all this most frequent source of recurrence. There are two ways in which this may be accomplished:

(a) *Schmieden's operation.*—"After isolation and ligature of the sac in the usual manner, he pulls upon the cord and dissects the testis entirely free from the scrotum. The internal oblique and transversalis muscles are then split in the line of their fibres by blunt dissection about one inch above the internal ring. The testis is drawn through the aperture, which is then narrowed by one or two catgut stitches to the exact size of the cord. The inguinal canal is completely obliterated by suture of the conjoined muscles to Poupart's ligament throughout their length (see fig. 6). The testis is replaced in the scrotum and the external oblique repaired over the cord.

"It has two apparent advantages: first, that the cord, instead of passing from the inner margin of the stretched ring through muscles already weakened, but brought together by suture, now runs outwards from the peripheral part of the ring through a fresh incision in healthy muscles; and second, that the new inguinal canal is longer and more oblique than the one it replaces. In criticism it must be pointed out that the inherent defects of the Bassini still apply to the closure of an empty canal, and that complete dislocation of the testicle may bring in its train sequelæ such as atrophy and hydrocele" (Ogilvie). I must confess that the inherent defects of the Bassini have not deterred me from undertaking this operation, but I do draw the line at the trauma involved in dislocating the testicle from the scrotum.

(b) *An alternative method.*—The following method of constructing a new internal ring is quite as efficient as Schmieden's, considerably less traumatic and much easier to perform. The idea was obtained originally from Ogilvie's account of his silk-lattice repair, in which he incises the internal oblique near its origin from Poupart's ligament in order to get the cord mobilised in a lateral direction for the repair of a weak posterior wall. In the description that follows I have split the operation into two phases in the hope that the principles involved may be made more clear.

Phase 1.—The steps of the standard operation are followed up to the point where the cremaster has been incised and the contents of the cord exposed. The internal oblique and transversalis muscles are now divided close to their origins from Poupart's ligament in the line of the inguinal canal for a distance of 1 to 1½ in. The sac is then isolated, ligated at its neck, and excised. Two small retractors are inserted and the cut ends of the muscles gently separated. This gives an unimpeded view of the stretched internal ring and allows a comparatively easy closure of the torn or stretched transversalis fascia. Once this has been accomplished, the cord is brought well up into the V of the incision and held with slight tension while the two arms of the V are resutured by two or three interrupted catgut or silk sutures, thus reconstituting the cut muscles around the cord, which now emerges through a well-fitting aperture placed well out in a lateral position (figs. 7, 8, and 9). The construction of this new internal ring may be modified as is shown in figs. 10 and 11. The conjoined tendon is then sutured to Poupart's ligament by a series of interrupted catgut or silk sutures, thus closing the old internal ring and the entire inguinal canal. The external oblique is repaired over the cord and the skin incision closed in the usual manner.

The operation in this form is a modified Bassini with the following advantages: (1) the cord now emerges through a newly constructed and well-fitting muscular internal ring placed well away from the "danger area"; (2) the new canal is longer and more oblique than the one it replaces; and (3) the repaired outlet for the cord through the transversalis fascia now abuts directly against the newly constructed muscular ring, allowing no leeway for the formation of a new sac. Its apparent disadvantages are incisional trauma to the internal oblique and transversalis muscles, and the alleged defects of the Bassini operation.

These two apparent disadvantages must be considered before proceeding to phase 2 of the operation. All experienced surgeons are aware that clean incision of the muscles of the abdominal wall with immediate resuture of the cut ends rarely produces any permanent weakness, except in cases of excessive and protracted sepsis, so we shall pass on to the defects of the Bassini repair. I have attempted to show elsewhere that the main disadvantage of the Bassini is its inability to protect the internal ring against the formation of a new oblique sac. However, the operation has been condemned on the grounds that the conjoined tendon is pulled down and distorted, thereby having to function at a disadvantage; and that the muscle fibres of the conjoined tendon cannot be expected to form a firm and permanent union with the fascia of Poupart's ligament. But if it is an accepted fact that the conjoined tendon shuts down on Poupart's ligament, "like the upper eyelid on the lower," in active contraction, there can be no distortion during the active phase. Secondly, the tension on the holding sutures must be relaxed, if anything, during the process of straining, because the conjoined muscles have been sutured in the position they would take up normally when in active contraction, and should only be present during relaxation—i.e., when the conjoined tendon attempts to regain its arched formation in the resting phase. Therefore the tearing away of the conjoined tendon pictured so vividly in the mind's eye of the anti-Bassiniites during active movement and postoperative coughing is a slight misconception. It can only occur as the result of localised

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necrosis produced in the manner already suggested. Furthermore, no-one raises the question of satisfactory adhesion of the conjoined tendon to Poupart's ligament in cases of simple closure of the inguinal canal after removal of the cord and testicle, even though the operation is performed on old and decrepit human beings, suffering, in many cases, from extremely large gaps in the posterior wall. Nor does the type of suture material seem to matter. Why should the actual process of adhesion be any different in the two cases? If the "danger area" is closed completely, I cannot see how the mere presence of the cord per se can affect the issue.

Phase 2.—In any case the surgeon is not compelled to stop at this point: tension on the conjoined tendon may be relieved by the Scott-Tanner rectus sheath incision, or the posterior wall may be reinforced by the Bloodgood rectus flap operation, and/or the Willys Andrews repair. A combination of the latter two is well within the compass of every surgeon and will not throw any greater strain on Poupart's ligament than either the Gallie or the silk-lattice repair. In this way almost every conceivable type of complication may be dealt with, and almost every conceivable mood of the surgeon satisfied; and at the same time a sufficiently shock-proof method of primary repair can be affected, without involving the patient, and particularly the soldier, in yards of fascia lata or binding him with fetters of floss silk, and one that may yet save the merchant seaman from becoming a sort of animated ironclad.

OPERATIONS FOR DIRECT INGUINAL HERNIA

The repair of a direct hernia has as its primary aim the construction of a strong posterior wall, which will not weaken by stretching. As I have mentioned before, a direct hernia results from a progressive atrophy of both the muscles and the layers of fascia in the region of the inguinal canal, so any attempted reinforcement by local fascial flaps is doomed to failure. Even the Gallie fascia lata repair is not proof against prolonged and continuous strain. It is here that the silk-lattice repair of the Ogilvie type fulfils its most useful function.

Postoperative Care

No article on inguinal hernia can be considered complete without some reference to aftercare. There is little doubt that the 3 weeks' postoperative recumbency is essential, and that light duty after 8–10 weeks, followed by a return to full duty at the end of the fourth month is a fairly safe procedure; but at the expense of being considered old-fashioned I maintain that the fate of a hernia is sealed on the operating-table.

Conclusion

The primary aim of this article is to show how acquired and large oblique hernia, which account for a relatively high proportion of recurrences, may be adequately treated without recourse to operations that require the introduction of large quantities of unabsorbable suture material or secondary operations on the thigh. The avoidance of the use of unabsorbable suture material is a point of some importance, particularly when dealing with Army personnel in tropical or semi-tropical countries; while accessory scars on the thigh are often used as a convenient "line of evacuation" to a lower medical category.

I wish to express my gratitude to Major-General W. H. Ogilvie for the interest he has taken in my technical views; to Brigadier A. E. Porritt for permission to publish this article.

REFERENCES

Edwards, H. C. (1943) *Brit. J. Surg.* **31**, 172.
Ogilvie, W. H. (1937a) In R. Maingot's Post-graduate Surgery, London, vol. III. (1937b) Prognosis, London, vol. II, p. 183. (1937c) *Proc. R. Soc. Med.* **30**, 532. (1938) *Proc. Mayo Clin.* **13**, 394.
Page, C. M. (1942) *Proc. R. Soc. Med.* **36**, 185.

THE NATION'S HEALTH.—Under this title the British Institute of Public Opinion has issued in pamphlet form the three surveys on the Government plans for a National Health Service which they conducted last year among doctors, medical students, and the public (*Lancet*, 1944, ii, 213, 222, 258). A few copies are obtainable from the institute, Aldwych House, Aldwych, London, WC2.

TREATMENT OF THYROTOXICOSIS WITH THIOURACIL

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THIOURACIL has now been used in the treatment of thyrotoxicosis in this clinic for over a year. More than 40 cases have received the drug, of which 36 have had systematic records of progress made; 25 of these have been observed for 6 months or more. The 36 cases comprise 28 of primary hyperthyroidism, 4 of toxic adenoma, and 4 of recurrent thyrotoxicosis after thyroidectomy. Five were males, 31 were females. Four had coincident diabetes mellitus; 2 were pregnant during part of their treatment. The age at onset of the disease varied from 16 to 64 years, with a mean of 38.

The patients were at first seen at intervals of 1–3 weeks, but as they improved at intervals of some months. At each visit pulse-rate, blood-pressure, body-weight, basal metabolic-rate (BMR), and fasting white blood-cell count were determined. An attempt was also made to obtain an objective record of the size of the thyroid gland by the crude method of measuring the circumference of the neck.

The general effects of treatment of the whole group are seen in fig. 1, in which are plotted the means of the results of the observations made nearest to 2 weeks, 1, 2, and 6 months after commencing treatment. The figures for 6 months are the means of 25 cases only. The only case which failed to respond to thiouracil was a diabetic described more fully below. Another patient with thyrotoxicosis recurring after removal of a toxic adenoma showed little fall in BMR but the pulse-rate and pulse-pressure fell, the weight rose, and the patient felt better. In all but the diabetic mentioned, flushed skin, tremor, nervousness, palpitation, and sweating regressed after the drug had been begun, though the time required for response varied considerably from case to case. The patients themselves were in no doubt as to subjective improvement. Exophthalmos was not usually appreciably affected, though in a few cases it diminished. In some cases the gland enlarged during treatment; in others it shrank. The mean circumference of the neck before treatment was 32·4 cm. and after treatment 32·9 cm. This small increase is not significant, especially in view of the increase in body-weight. No definite difference in response was seen between those under and over 35 years, though there was a slightly more rapid effect on the BMR in the older group. The small number of males responded quite as well as the females. The 4 cases of toxic adenoma have all responded to the drug though in varying degree; one patient with BMR 71% above standard had this reduced to 13% below standard by treatment for 3½ months and has remained well. On the other hand, in a patient with toxic adenoma the

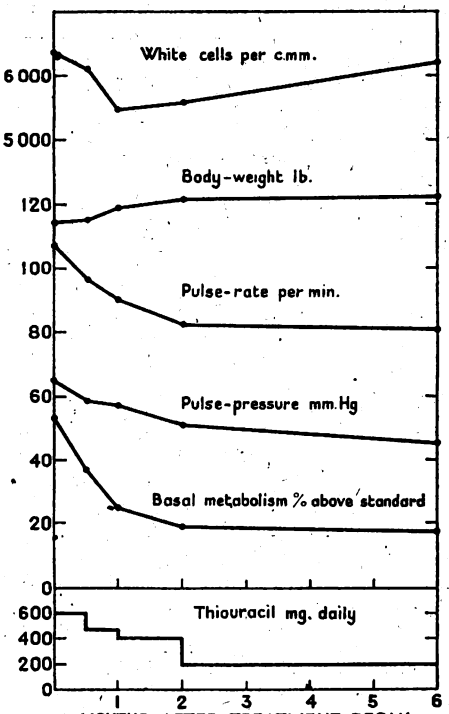

Fig. 1—Mean findings in 36 cases. Findings at 6 months refer to 25 cases only.

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BMR was originally 38% above standard and is still 16% above standard despite 7 months' treatment, and, though she feels well, she still requires 400 mg. thiouracil daily. The cases of thyrotoxicosis recurring after operation responded well though rather slowly; one is developing pressure symptoms with an enlarging thyroid gland for which surgical treatment may be required.

THYROTOXICOSIS WITH DIABETES

Four cases were diabetic. In 3 the diabetes was primary and these all responded well to thiouracil. One of them developed a gastro-intestinal upset with nausea, vomiting, and severe ketosis 3 weeks after commencing thiouracil, but the drug was not thought to be responsible for this incident as he recovered very rapidly when given extra insulin, intravenous glucose-saline, and suitable diet, thiouracil being continued meanwhile. The diabetic in whom thyrotoxicosis was the primary disease is the only patient in my series who has failed to respond to thiouracil.

CASE 1.—Married woman, aged 35, admitted to hospital in June, 1944, for thyroidectomy. She had had an enlarged thyroid gland for 15 years, but at the age of 33 palpitation, loss of weight, and exophthalmos commenced. The thyroid was slightly enlarged, uniform, and firm; pulse-rate 112 per min., blood-pressure 130/75 mm. Hg; BMR 88% above standard, glycosuria profuse, blood-sugar 244 mg. per 100 ml. On being questioned she admitted having had thirst, polyuria, and puritus for 2 months. The diabetes was treated by diet and insulin, which had to be increased to 92 units daily before glycosuria was controlled. Lugol's iodine 2·7 ml. daily was given for 11 days, when it was decided she should not be treated surgically and iodine was replaced by 600 mg. thiouracil daily. The patient was allowed home on Aug. 2, 1944, to attend as an outpatient; pulse 112 per min., BMR 59% above standard. The course of treatment is shown in fig. 2.

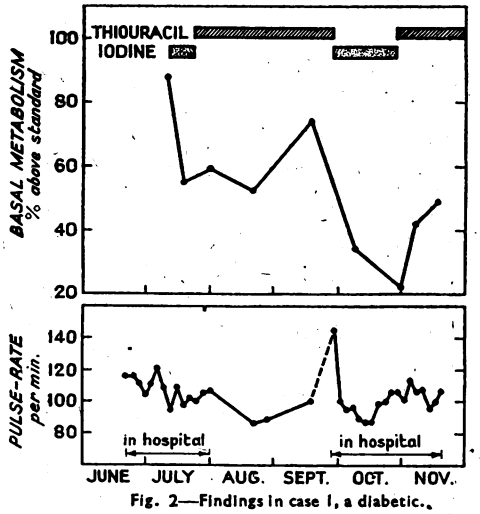

Fig. 2—Findings in case 1, a diabetic.

On Sept. 26 she took a pain in her chest, and, being disinclined for food, she stopped her insulin and became rapidly ill. She was admitted to hospital on Sept. 28 in coma. Despite vigorous treatment with insulin and intravenous glucose-saline the diabetes was not controlled for 36 hours, by which time her pulse was very rapid and feeble and she seemed to be in thyroid crisis. Lugol's iodine was therefore given. Within 24 hours there was a striking fall in pulse-rate and shortly thereafter there was profuse diuresis (see table). General improvement with a fall in BMR was maintained, but her spleen was found to be enlarged and she had hypochromic anæmia with anisocytosis (hæmoglobin 7·1 g. per 100 ml.; red cells 3,470,000 per c.mm.).

After 4 weeks on iodine the pulse-rate again tended to rise and iodine was replaced by thiouracil 800 mg. daily. By this time the spleen was no longer palpable. Following the change to thiouracil the thyroid gland rapidly diminished in size, but the BMR has risen again.

THYROTOXICOSIS IN PREGNANCY

Two cases have been treated; their histories are as follows.

CASE 2.—Primipara, aged 28. Seen on account of glycosuria on April 28, 1941, which proved to be due to low renal threshold. She was then 4 months' pregnant. She had exophthalmos, flushed skin, pulse-rate of 100 per min., slightly enlarged thyroid; BMR 50% above standard. She was treated with iodine with the results shown in fig. 3. Her clinical condition improved markedly at first but towards the end of pregnancy the thyrotoxicosis became worse. A still-born child was delivered without difficulty at term. Despite continuation of iodine treatment her condition deteriorated but she refused operation or any hospital treatment. By August, 1943, her heart was grossly enlarged and she was extremely ill. She was found to be pregnant again and a fatal termination seemed likely. Iodine was stopped in mid-August, 1943, and thiourea commenced on Oct. 20. The fall in BMR and pulse-rate shown in fig. 3 was accompanied by a well-marked clinical improvement. Thiourea was replaced by thiouracil when it became available and good progress was maintained, the heart diminishing considerably in size. Four weeks before confinement thiouracil was stopped and iodine given. She was delivered of a healthy child on April 21, 1944, without difficulty and made a rapid convalescence. Thiourea and thiouracil probably saved this patient's life.

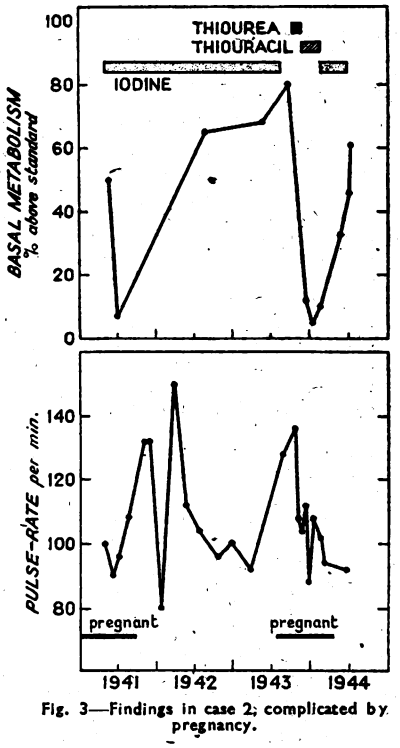

Fig. 3—Findings in case 2, complicated by pregnancy.

CASE 3.—Married woman, aged 37; two previous pregnancies. She had had thyroidectomy for thyrotoxicosis in May, 1943. On Oct. 19, 1943, BMR was 60% above standard, pulse 100 per min. She was treated with 600 mg. thiouracil daily and BMR had fallen to 14% above standard by Nov. 27, 1943. Thiouracil was stopped on Dec. 10, 1943, as thyrotoxicosis was negligible. The patient did not menstruate

FINDINGS IN CASE 1

	September			October				
	28	29	30	1	2	3	4	5
Pulse-rate (per min.)	AM PM 136 140	AM PM 152 166	AM PM 172 96	AM PM 108 96	AM PM 104 108	AM PM 88 96	AM PM 92 88	AM PM 96 96
Glycosuria	+++ +++	+++ ±	+++ ++	++ +++	+++ +++	++ +++	++ +++	+++ +++
Ketonuria	+++ ++	++ −	± ±	− −	− −	− −	− −	− −
Insulin (units) ..	290	260	50	40	40	40	44	44
Carbohydrate (g. daily) ..	220	250	150	140	140	140	140	140
Urine vol. (ml.) ..	860	1040	1650	1870	1700	5820	6740	2940
Lugol's iodine (ml.)	nil	5·3	2·7	1·8	1·8	1·8	1·8	2·7

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after November, 1943. Following cessation of thiouracil the BMR rose again to 67% above standard on Jan. 12, 1944; 600 mg. thiouracil daily was again prescribed from this date until April 10, when BMR was 33% above standard, then 400 mg. daily until May 22 (BMR 5% above standard) and 200 mg. daily till, on Aug. 30, the patient was delivered by cæsarean section, this being necessary on account of placenta prævia. The child, a female, had an enlarged thyroid gland but was normal in all other respects. The entire outline of the gland was readily visible in the neck; it was soft and offered no apparent restriction to respiration. The child fed well and progressed normally apart from an acute respiratory infection a few days after birth. At the age of 3 months the gland was no longer apparent and growth has been normal.

In neither of these patients was there any sign of toxæmia from thiouracil; the drug controlled hyperthyroidism well during pregnancy.

TOXIC EFFECTS

No appreciable toxic effects have been seen in any of these patients. In the 2 for whom thiourea was used there was some nausea and halitosis. There does appear to be a tendency for the white-cell count to fall after giving thiouracil (fig. 1), but this is usually followed by a rise even though the dosage is not reduced. It has been the practice during the past six months to have a differential count made when the white-cell count fell below 3500 per c.mm. One patient developed granulocytopenia while taking 200 mg. thiouracil daily (white cells 3100 per c.mm.; 920 granulocytes per c.mm.); there were no clinical signs of agranulocytosis; thiouracil was stopped and 2 weeks later the white cells numbered 4600 per c.mm. The splenic enlargement in case 1 may have been the result of thiouracil, but she had had diabetic coma and hypochromic anæmia which complicated the picture. No other toxic effects have been seen.

DISCUSSION

Thiouracil has proved very effective in the treatment of thyrotoxicosis whether of the primary type, from toxic adenoma, or recurring after thyroidectomy. The small number of cases of toxic adenoma treated have, on the whole, been rather slower in response than the primary cases. This agrees with the experience of Astwood (1944), but McGavack and his colleagues (1944) found that toxic adenomas responded as quickly as primary cases. The presence of other endocrine diseases is no contra-indication to the use of thiouracil. I have found it effective in 3 out of 4 diabetics. Nine diabetics have been successfully treated by other workers (Astwood 1943 and 1944, McGavack et al. 1944, Kahn and Stock 1944) Rose and McConnell (1944). Bartels (1944) successfully treated a case of thyrotoxicosis in acromegaly, but Astwood (1944) found a relatively poor response in 2 acromegalics with thyrotoxicosis. The latter successfully treated a case of thyrotoxicosis in Addison's disease.

To judge from the 2 cases treated during pregnancy, this is no contra-indication to the use of thiouracil so far as the mother is concerned, but the possibility of producing an enlarged thyroid gland in the fœtus suggests that thiouracil should be replaced by iodine some weeks before delivery. Whether this enlargement of the fœtal thyroid is due to thiouracil entering the fœtal circulation and there producing effects similar to those seen in normal animals, or to excess maternal thyrotropic hormone causing hypertrophy of fœtal thyroid, is uncertain; in the former case signs of myxœdema might be expected in the latter signs of hyperthyroidism. In case 3 the child had no clinical signs of either condition apart from the large thyroid. McGavack et al. (1944), Rose and McConnell (1944), and Williams and Bissell (1943) have treated pregnant patients with thiouracil and found that it controlled thyrotoxicosis in the mother. In Rose and McConnell's patient thiouracil was replaced by iodine a week before term and no abnormality was seen in the child. The other authors do not comment on the condition of the child. The experimental work of Hughes (1944) on pregnant rats fed with thiouracil showed that the young had hyperplastic thyroids and that they failed to grow for some time after birth. This suggests that the young were hypothyroidic and that thiouracil is transmitted by the placenta.

Four patients previously treated with iodine failed to respond to thiouracil for several weeks after commencing treatment. In case 2 the patient had also received iodine but an interval of over 2 months elapsed between stopping iodine and commencing thiourea and her response was immediate. Astwood and others (1943) noted that iodine delayed the effect of sulphaguanidine on the thyroid in rats, and Astwood (1944) observed that iodine had a similar effect with regard to thiouracil in man. On the other hand, Astwood found that, even after giving thiouracil, iodine would reduce the basal metabolism and the size of the thyroid gland. This is borne out by the results in case 1 (fig. 2), where the extraordinarily rapid effect of iodine is noteworthy. This suggests that where a very rapid effect is required in thyrotoxicosis iodine is preferable to thiouracil, but against the use of iodine is the fact that it will delay the effect of thiouracil given subsequently. Case 1 appeared to be refractory to thiouracil but responsive to iodine.

Most of the patients were allowed to continue their ordinary work as soon as the pulse-rate and BMR approached normal. In a few cases they continued work throughout though usually against advice. From the experimental work of Baumann, Metzger, and Marine (1944) thiourea prevents the thyroid gland from forming thyroglobulin, and the work of Astwood and others (1944) has shown that the changes in the thyroid after giving sulphaguanidine are due to increased pituitary stimulation resulting from diminished thyroglobulin formation. If, as seems likely, primary thyrotoxicosis is the result of over-stimulation of the pituitary gland by higher centres, thiouracil treatment, like surgical, is really palliative and does not remove the cause of the disease. Proper treatment should also aim at minimising the noxic stimulus. I therefore consider it wise to prescribe adequate rest for these patients even though thiouracil may control the toxic symptoms without rest. Whether rest will result in the disease being more readily controlled by thiouracil can only be decided after a long clinical trial. Nevertheless I have seen no ill effects from allowing patients to continue work while under treatment, apart of course from those with appreciable cardiac damage or other complications.

It will be some time before it is possible to assess the relative merits of thiouracil versus surgical treatment. The provisional view put forward now in that thiouracil should be tried first in most cases. Surgery in skilled hands is still probably the quickest way to ensure recovery from thyrotoxicosis, and where time is an important factor it may be the method of choice. Patients suffering from pressure symptoms may require surgical treatment on account of the tendency of thiouracil in some cases to cause enlargement of the gland; it does not at present seem possible to predict whether the gland will enlarge or shrink on treatment with thiouracil. Surgery may offer a better æsthetic result in patients with pronounced enlargement of the thyroid gland.

The dosage of thiouracil found most suitable is essentially the same as that used by others who have treated considerable numbers of patients (Astwood 1944, McGavack et al. 1944, Williams and Clute 1944). It has never been necessary to give more than 800 mg. daily, and the initial dose has usually been 600 mg. daily. The maintenance dose has usually been 200 mg. daily or less, though some patients have required as much as 400 mg. daily. From published work it seems that toxic effects from thiouracil have often been due to over-dosage, but Astwood (1944) records a case of leucopenia in a patient who had received 600 mg. daily in combination with a sulphonamide drug; McGavack and others (1944) had a case of agranulocytosis after 500 mg. daily; Sloan and Shorr (1944) noted jaundice after 800 mg. daily; Kahn and Stock (1944) had a fatal case of agranulocytosis after 800 mg. daily. Provided the dose is small, however, the danger of toxic effects does not appear unduly great.

It has been possible to stop all treatment in 4 of my cases for 8 months and in 3 others for 3½ months without recurrence of thyrotoxicosis, the average duration of treatment in these cases being 4 months. They included all degrees of severity and age, and one case of toxic adenoma. Other cases have however had to continue to take the drug for a year. Even where thyrotoxicosis was absent and no treatment was being given the thyroid gland sometimes remained enlarged.

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SUMMARY

Thirty-six cases of thyrotoxicosis were treated with thiouracil, including 4 with toxic adenoma, 4 recurring after thyroidectomy, 4 diabetics, and 2 during pregnancy. Pulse-rate, blood-pressure, body-weight, basal metabolism, and white blood-cell count were regularly observed. All but one (a diabetic) responded well. The effects were similar in males and females and at all ages.

The maximum dose required was 800 mg. daily, with 200 mg. as a maintenance dose. Seven cases have remained well after treatment though the drug has not been given for periods of 3½ to 8 months.

Thiouracil was beneficial in thyrotoxicosis during pregnancy and did not affect the pregnancy except that in one patient receiving the drug until confinement the child had an enlarged thyroid gland.

No toxic effects have been seen, though one patient had transient granulocytopenia.

Most of these patients were under the care of Dr. Alex. Glen, physician to the Victoria Infirmary, and I am indebted to him for permission to treat them and to publish the results. I am also grateful to Dr. Stanley Graham, physician i/c sick nursery, Glasgow Royal Maternity Hospital, for allowing me to publish data relating to the infant of one of the patients, and to the staff of the pathology department of the Victoria Infirmary for making hæmatological examination.

REFERENCES

Astwood, E. B. (1943) *J. Amer. med. Ass*, **122**, 78; (1944) *J. clin. Endocrinol.* **4**, 229.
— Sullivan, J., Bissell, A., Tyslowitz, R. (1943) *Endocrinology*, **32**, 210.
Bartels, E. C. (1944) *J. Amer. med. Ass.* **125**, 24.
Baumann, E. J., Metzger, N., Marine, D. (1944) *Endocrinology*, **34**, 44.
Hughes, A. M. (1944) *Ibid*, **34**, 69.
Kahn, J., Stock, R. P. (1944) *J. Amer. med. Ass.* **126**, 358.
McGavack, T. H., Gerl, A. J., Vogel, M., Schwimmer, D. (1944) *J. clin. Endocrinol.* **4**, 249.
Rose, E., McConnell, J. (1944) *Amer. J. med. Sci.* **208**, 561.
Sloan, M. H., Shorr, E. (1944) *Science*, **99**, 305.
Williams R. H., Bissell, G. W. (1943) *New Engl. J. Med.* **229**, 97.
Williams, R. H., Clute, H. M. (1944) *Ibid*, **230**, 657.

SHOVELLERS' FRACTURE

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CAPTAIN RAMC

From a Prisoners-of-War Hospital in Germany

McKellar Hall (1940) has described 15 cases of fracture of the spinous processes of the cervical or dorsal vertebræ as clay-shoveller's fracture, and Watson-Jones (1941) remarks on its rarity in Britain. So long ago as during the building of the Kiel Canal, German surgeons were conversant with this occupational injury, which they termed *schipper Krankheit*. Here are described 8 cases of this fracture-displacement of part of the spinous process of one or more of the 6th or 7th cervical or 1st dorsal vertebra. Clay is not necessarily involved in their causation.

CASE-HISTORIES

CASE 1.—Age 23. Shoemaker before war. Had been doing heavy work for 6 weeks before accident. No general illness around that time. On Oct. 20, 1941, shovelling ordinary spadeful of sand, lifting with shoulders braced when half upright; felt severe pain between shoulder-blades and had to be helped upright. Felt and heard a snap between his shoulders. Painful, but he was able to work again in 3 days' time with only slight pain. A week later had a similar attack—felt it go again! More painful this time and had 5 days off. Back to work but pain in shoulders made him give up. X ray showed fracture and downward displacement of spinous process of 7th cervical vertebra.

Progress: On Dec. 14 went back to work and complained of no pain. One could feel a slightly mobile depressed 7th cervical spinous process.

Remarks: The accident was the first complaint. Position stooping. Felt the snap when taking weight on left arm; probably re-displacement laterally of the fractured process.

CASE 2.—Age 28. Brewer's labourer before war. Heavy work for 8 weeks before accident. No general illness around that time. On Nov. 10, 1941, felt pain across the shoulders. Became gradually worse for 2 or 3 days when shovelling sand. Suddenly, when lifting, something at base of neck went snap, producing intense pain in the shoulders, severe for about a week but gradually eased after that. X ray showed fracture and downward displacement of the spinous process of 7th cervical vertebra.

Progress: Returned to work a month after the injury without disability.

Remarks: Complained for 3 days previously of vague pain across the shoulders. The accident was sudden when lifting. He felt severe pain.

CASE 3.—Age 23. Dairyman before war. Heavy work for 7 weeks before accident. Had diphtheria about 2 months previously. On Oct. 1, 1941, complained of pain in shoulders and had 11 days off. The first 3 days he was back at work the pain got gradually worse. On Oct. 14, when picking up a shovelful of sand in a crouching position, felt a sudden click in back and something gave way with a severe pain at the base of the neck, causing him to fall to his knees. It was 2 to 3 hours before he could move his shoulders and 3 days before he could take off his own coat. After 14 days' rest, he attempted to work one day but the pain was as bad as before. Complained of a hard lump in his neck and of pain radiating down to his elbow. On Dec. 10, still got pain in his neck when he tried anything heavy, also pain like needles sticking into his spine. X ray showed fracture and downward displacement of the spinous processes of 6th and 7th cervical vertebræ. No fractures of the bodies of the vertebræ were evident.

Progress: After Dec. 24, worked for 6 months when he reported sick, complaining of cough and wasting of left trapezius and left sternomastoid muscles. X ray showed a doubtful old fracture of body of 7th cervical vertebra. He gave a history of an injury to his back as a child. (This seems to have no relation to the shoveller's fracture.)

Remarks: 14 days before the trouble began, had vague pains in his back. The final accident was sudden, in a stooping posture; felt the snap at the instant of taking the weight on the left arm. Question arises, whether the 6th and 7th vertebræ were fractured separately, one 14 days after the other?

CASE 4.—Age 21. Manual labourer before war. Heavy work for 7 weeks before accident. No general illness around that time. On Oct. 27, 1941, his shoulders began to "catch him" on his upstroke with a loaded shovelful of sand. No sudden origin. Only troubled him in extreme movements. Pain got gradually worse and he said he could feel the bone in his back grating. X ray showed a half centimetre of downward displacement of the fractured spinous process of the 7th cervical vertebra.

Progress: No pain after the third week. Went to work a month after the injury without disability.

Remarks: Gradual onset. The position he was in when the pain caught him was always at the beginning of the upstroke.

CASE 5.—Age 25. Labourer and deliveryman before war. Heavy work for 7 weeks before accident. Developed pneumonia a month later (Nov. 25). On Oct. 20, 1941, complained of pain in his neck and of difficulty in hanging his coat up. Carried on working for 2 days when the pain became worse. Had 7 days' rest and was somewhat easier. On Oct. 29, in the afternoon of his first day back at work, when heaving a shovelful of sand at a truck was halfway through a stroke when something clicked in his back and he could not straighten his shoulders. Had acute pain for 2 hours between his shoulder-blades. During the next month complained of pain whenever he lifted anything with his left hand. The pain eased off after this but some tenderness remained at the sides of the 7th spinous process. X ray showed 2 cm. downward displacement of the spinous processes of the 6th and 7th cervical vertebræ.

Progress: Returned to work without pain on Nov. 20, 1941. After his pneumonia he complained no more of pain.

Remarks: 9 days before the accident had pain in the back of his neck. The accident was sudden; he was in a stooping position and had just taken the weight on his left arm when he felt the snap. Question arises whether the 6th and 7th cervical vertebræ were fractured separately, one 9 days after the other.

CASE 6.—Age 24. Labourer before war. Heavy work for 10 weeks before accident. Developed pneumonia on Dec. 30, 1941, and had influenza the week before the accident. On Dec. 16, 1941, felt sudden pain between shoulders while shovelling at the end of a day's work. Pain cleared up by Dec. 28, and he had little disability except for slight tenderness for the first 2 weeks over the spines of the 6th and 7th cervical vertebræ. Later, when he returned to his work in February, after his pneumonia, he complained of grating and an ache in his back whenever he did any lifting. X ray

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showed downward displacement of the spinous processes of the 6th and 7th cervical vertebræ.

Progress: On account of the ache across the shoulders, and for complicating emotional reasons, has only been on light work since. Little disability evident.

Remarks: The accident was the first complaint. Sudden pain between the shoulders. Only one accident responsible for avulsing two spinous processes.

CASE 7.—Age 23. Chemist's assistant before war. Heavy work for 29 weeks before accident. Nutritional œdema for 3 months, beginning in August, 1941. In June, 1942, at 8 o'clock one morning, when filling his first skip with sand from a low position and taking the strain of a shovelful on his left arm, he felt a click and severe sharp pain between his shoulder-blades, at the root of his neck. The shovel fell out of his hand as though the arm was paralysed; he walked with his head and neck bent forward and to the left to ease his pain. It proved painful for him to raise his arms more than 20° from his side. He had 3–4 days of acute pain and "grating" even when lying in bed. The spinous process of 7th cervical vertebra was tender and the skin over it slightly swollen. After 7–10 days had no pain except on lifting. The fragment was mobile and grated when moved with neck hyperextended on first examination. X ray showed fracture of spinous process of 7th cervical vertebra.

Progress: By Feb. 17, 1943, had very little disability, except a tired feeling in the shoulder towards the end of the day. Has done no manual work since.

Remarks: The accident was the first complaint. It was sudden, in a stooping position, at the instant he took the strain of the shovelful on the left arm.

CASE 8.—Age 26. Dockworker and labourer before war. Heavy work for 26 weeks before accident. Nutritional œdema in winter 1941–42. On Sept. 18, 1942, was throwing hard soil upwards at a distance of 6 ft. with a shovel when at second skipful felt a pain under his left shoulder-blade; thought he had rheumatism from the damp. The ache under his shoulder got gradually worse. He rested after doing 5 skips and complained that something was wrong with his back. On starting work again, as he dug his shovel into the soil for the 11th shovelful he felt something snap at the base of his neck. He tried to straighten up but failed, felt faint, and dropped his shovel. After sitting down for half an hour he felt better and could walk home. The pain soon eased off, except when he was lifting. On first examination, there was some tenderness and redness over the 7th spinous process. X ray showed fractured spinous process of 7th cervical vertebra.

Progress: By Feb. 19, 1943, there was no disability.

Remarks: Had complained of pain under the left scapula all morning. The accident was sudden, in a stooping position, at the instant of taking the strain of a shovelful on the left arm.

PATHOLOGY

The lesion is a fracture of the spinous process of the 7th (or 6th and 7th) cervical spinous process about its middle. The line of fracture, running at right-angles to the long axis of the process, was evident radiologically in every case. The cause must have been muscular pull—i.e., indirect violence. In no case was any rarefaction or excessive calcification of the bone evident. In most cases there was also separation of the fragments with downward displacement of the detached fragment (fig. 2). In some cases there was over-riding with subsequent depression of the spinous prominence (fig. 1). In early cases this was camouflaged by redness and inflammation around the process. One case demonstrated the anterior bending (fig. 3). In no antero-posterior radiogram was any lateral displacement to be seen. When the ligamentum nuchæ was relaxed by hyperextension of the neck, crepitus and movement of the fragment could usually be elicited.

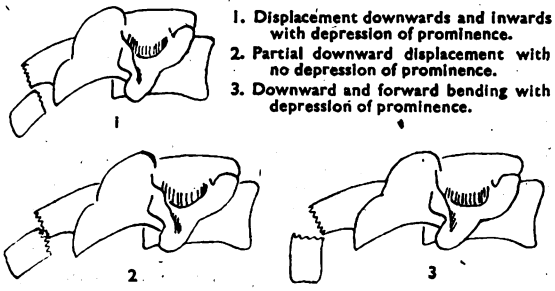
An interesting factor is the premonitory phase of pain in the back, present in some cases for a few hours or days before the actual snap or click in the neck, which can be considered as marking the breaking of the bone.

DISCUSSION

These eight men were taken prisoner in Greece or Crete in the spring of 1941, and after varying fortunes and conditions travelled to Germany. They spent up to a month in a transit camp at Salonica, where the conditions as regards food were poor compared with the standards to which they had been accustomed. While in Germany during August and September their ration was at a maintenance level and did not restore the general condition of these men very rapidly. To judge from the slow healing of skin ulcers and the number of cases of nutritional œdema, there was an essential lack of basic nutritional factors in the diet.

These 8 cases are from about 1100 British soldiers, working during the first months of captivity. Subsequently another 7 men developed this condition, but owing to changes of *Stalag* I have not had the opportunity of collecting details. The 15 cases observed all occurred during their first year of work.

Although everyone was not shovelling all the time, they were on this type of work for about two out of the twelve months. No cases showed any previous predilection to fractures (with the possible exception of case 3), or gave any rheumatic history or evidence of nutritional deficiency before capture.


1. Displacement downwards and inwards with depression of prominence.
2. Partial downward displacement with no depression of prominence.
3. Downward and forward bending with depression of prominence.
1
2
3

A noticeable fact was that although a considerable proportion of the 1100 men were conscripts and war-time soldiers from offices and non-manual jobs, and others were regular soldiers, these classes were relatively free—only 2 of the 8 men had had sedentary jobs before the war, and none were regular soldiers. Generally speaking, those affected were of good physique and accustomed to hard manual labour. The accident did not happen as soon as the man started the shovelling work but after at least 6 weeks' employment, while some cases occurred several months later, by which time one would expect the spinous processes to have become adjusted to the stresses and strains of this work. (Case 4 had been a manual labourer before joining the Army and had been used to similar work, yet he sustained this fracture 7 weeks after beginning to shovel sand as a prisoner-of-war.)

Poor nutrition, being common to all the cases, seems a possible contributory cause, but unfortunately no detailed inquiry could be made into the patients' vitamin status, or into the protein, fat, and carbohydrate contents of the diets.

Shovelling is undoubtedly the precipitating cause. In 5 cases the bone fractured was the 7th cervical spinous process and in 3 cases the 6th and 7th (McKellar Hall reports the first dorsal being involved, but I have never found this even among the other 7 cases not reported here). Thus it seems that the vertebra prominens is the one most liable to this injury, and as the 6th is often equally prominent it may also be involved. The ligamentum nuchæ is attached to these spinous processes and continues towards the occiput with a fibrous sheet connecting it to the spines of the other cervical vertebræ. In a stooping position this ligament is taut, and on account of its continuation caudally with the ligament connecting the spines of the dorsal vertebræ it exerts a compressing force on the prominent spinous processes.

A second factor is the muscular attachments to the spines and ligament. In this area we have the rhomboideus minor, the trapezius, and the splenius capitis of both sides. In fixing the scapula before taking weight on the left arm, the left serratus magnus plus the above 3 muscles (the splenius is supplementary) and the rhomboideus major of the left side are made to contract. If for some cause—e.g., fatigue, fibrositis, &c.—there is imbalance here in the contralateral opponents, then the strain of the lift when it is suddenly transferred on to the left arm and shoulder girdle will reach the backbone and exert a shearing inferolaterally directed action on the most prominent part of the muscular origin, the 7th or 6th spines and the ligament in that area, probably

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via the rhomboideus minor and the trapezius. One day, probably after repeated shearing stresses, the strain is severe enough to avulse the spinous process about its middle and displace it downwards and laterally. Then the readjustment of tensions which takes place when the man releases his grip on the shovel will centralise the displaced fragment, but on account of the taut ligament the downward displacement will usually remain.

McKellar Hall (1940) recommends early excision. This seems to be unnecessary at an early stage, a view supported by the early study in Germany and by Watson-Jones (1941). In all the present cases (except no. 3, whose peculiar complications I hesitate to attribute to this fracture) there has been very little disability after a month's rest from heavy work. The cases have been treated with heat and rest, progressing to graduated exercises, and at no time was there any indication for surgical removal of the fragment, which, in all probability, would cause more lasting weakness than the injury. The ultimate healing is only by fibrous union.

SUMMARY

Eight cases of fracture of the spinous process of the 7th, or 6th and 7th, cervical vertebra are described in prisoners-of-war shovelling sand or soil.

Besides the men's occupation, there are possible predisposing factors—nutritional deficiency, and muscular fatigue and incoördination.

Conservative treatment only is required for recovery.

It seems probable that many cases are overlooked.

REFERENCES

Hall, R. D. M. (1940) *J. Bone Jt Surg.* **22**, 63.
Watson-Jones, R. (1941) Fractures and Other Bone and Joint Injuries, London. 2nd ed.

UREA AND SULPHONAMIDE TREATMENT OF *BACT. COLI* MENINGITIS

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PENETRATING wounds of the brain in the casualties from Normandy have, in most cases, responded favourably to proper general and surgical management, including the administration of penicillin and sulphonamides. Wounds infected not only with streptococci and staphylococci, but also with clostridia have conformed with this rule. The most dangerous organisms in these cases have generally proved to be gram-negative bacilli—*Bact. coli* and related bacteria. It is academic to consider whether these organisms can produce a primary infection of the central nervous system such as brain abscess, encephalitis, and meningitis. But it is of great practical value to know, first, that they usually occur in the nervous system together with other organisms, and secondly, that such other organisms usually yield promptly to the effect of penicillin and sulphonamides. The gram-negative bacilli alone may, in pure culture, lead to a fatal issue.

Laboratory reports [1] indicate that, though the growth of sulphonamide-resistant gram-negative bacilli or gram-positive cocci is not impaired by sulphonamides or urea alone, it is inhibited by the combination of urea and sulphonamides. The unpublished experience of Captain Max Kutzer and Captain Raymond Rhodes, of a (US) General Hospital, shows that gonorrhœa, which had resisted treatment with both sulphonamides and penicillin in adequate dosage, responded to this combination of urea and a sulphonamide.

CASE OF *Bact. coli* MENINGITIS

A soldier received a penetrating wound of the brain in Normandy on June 14, 1944, when he was struck by a shell fragment about 1 cm. in diameter. The entrance wound was 1·5 cm. long and situated just below the inner end of the left eyebrow. The missile penetrated both tables of the left frontal sinus, crossed the midline and came to rest in the right occipital lobe of the brain. The patient also had three minor wounds from shell fragments in the limbs. On June 15 he was given sulphadiazine, and it was observed that his mental responses were slow. On the 16th all his wounds were debrided and sulphanilamide powder was applied to them. He looked ill, his tendon reflexes were diminished, and his neck was stiff. There was much pus in the nose and some in the pharynx. The spinal fluid, which was both sanguineous and purulent, contained 750,000 red cells and 6000 white cells per c.mm. The white cells were mainly neutrophils, and no organisms were seen on the smear. There is no report of bacteriological culture. The patient was given 5 grammes of sulphadiazine intravenously and then 2 g. by mouth every four hours.

By the 21st he had improved considerably, but drowsiness and neck rigidity persisted. Accordingly sulphadiazine was continued, but the dosage was reduced to 1 g. every four hours. There was moderate infection of the wound below the supraorbital ridge.

The patient did well until July 3, when he complained of a severe headache and chilly sensations. There was rigidity of the neck, and spinal puncture revealed cloudy fluid under increased tension containing 1430 white cells per c.mm., of which 83% were neutrophils. No organisms were seen on the smear. A report of bacterial culture is again lacking. Penicillin, 3000 units, was injected intraspinally, and sulphadiazine was again given by mouth.

When he was admitted to a general hospital on July 5 the wound in the left supraorbital region was healed. There was no neck-rigidity and the patient seemed in good condition. The nasal mucous membrane looked normal. X-ray films revealed bone fragments in the pole of the left frontal lobe. It was decided to remove these fragments and patch the defect in the dura, so as to seal the frontal sinus from the subarachnoid spaces and the brain.

Accordingly on July 7 a left frontal craniotomy was carried out, with pedicled periosteal graft to dura. Through a medium-sized left frontotemporal incision in the scalp, a small left frontal osteoplastic bone flap was made. The periosteum underlying the scalp was reflected forwards as a separate layer to be used as a pedicled graft. An extradural approach was made to the left anterior fossa. Several loose bone fragments between the posterior wall of the left frontal sinus and the hole in the dura were removed. The dural defect was 1 cm. in diameter. A small amount of yellowish fluid was found in the brain, consisting of pus and necrotic cerebral tissue. All bone fragments were removed from the brain, as far as the surgeon's finger could feel. A portable X-ray film likewise revealed no residual bone fragments. Penicillin and sulphanilamide powder was placed in the different layers of the wound, which was closed with interrupted black silk sutures in layers and without drainage.

LABORATORY OBSERVATIONS

Date in July	Spinal fluid									Blood contents (mg. per 100 c.cm.)	
	Pressures (mm. H_2O)	White cells (per c.mm.)	Polymorphs %	Chemical contents (mg. per 100 c.cm.)				Bacterial smears	Culture *Bact. coli*	Sulphadiazine	Urea (as nitrogen)
				Total protein	Urea (as nitrogen)	Sulphadiazine	Sugar				
15	320	232	100	180	..	..	None	+	+	..	..
16	480	40,000	100	490	..	..	10	+	+	..	..
17	..	27,000	100	..	..	..	..	+	+	..	..
20	150	2200	93	..	..	..	..	−	+	7	52
21	..	100	45	..	52	4·5	..	−	+	9	22
23	170	110	55	132	..	..	76	−	−	8	37
26	200	280	34	130	..	..	..	−	−	9	..

Although the patient had had meningitis there were no dense adhesions between brain and dura.

Specimens for bacterial study were taken from the left frontal sinus, the dural defect, and from the part of the brain from which the bone fragments were removed. Direct smears of each of the three swabs revealed occasional pus cells and gram-positive cocci. Cultures of each of the specimens grew *Streptococcus viridans* and *Bact. coli*. The streptococcus was sensitive to penicillin in vitro, but the *Bact. coli* was completely insensitive.

After the operation, the patient was given 1 g. of sulphadiazine by mouth and 20,000 units of penicillin parenterally

1. Tsuchiya, H. M., Tenenberg, D. J., Strakosch, E. A., Clark, W. G. *Proc. Soc. exp. Biol. NY*, 1942, **51**, 245.

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every four hours for four days, and his convalescence began uneventfully. The wound healed by primary intention. However, on July 14, he became somewhat disoriented and confused. On the 15th it was clear that there was a recurrence of meningitis, because the patient had fever, stiffness of the neck, well-marked confusion (he was found chewing a metal ash-tray), and moderate drowsiness. The spinal fluid was found to be turbid and under increased pressure. It contained 232 white cells per c.mm., no red cells, and 180 mg. of total protein per 100 c.cm. The smear revealed a gram-negative bacillus and culture grew *Bact. coli*. Penicillin, 7000 units, was administered intraspinally and 40,000 units intramuscularly, followed by 40,000 units of penicillin and 1 g. of sulphadiazine every four hours. Nevertheless, his condition became much worse and the spinal fluid became mucopurulent. After a spinal puncture on the 16th he was given 30 g. of urea and 2 g. of sulphadiazine every four hours by mouth. At first it had to be introduced into the stomach by gavage, because the patient was unconscious. Twelve hours after the urea was started the patient began to understand the spoken word and in another 12 hours he regained his ability both to understand and to speak. At this time he was still confused and disoriented, and the spinal fluid still contained dense yellowish fibrinous material, but there were relatively few organisms on the direct smears as compared with a great many the previous day, and the spinal fluid cell count dropped from 40,000 to 27,000 per c.mm. The concentrations of urea in the blood and spinal fluid are shown in the table.

Thereafter the patient's clinical improvement was steady and uneventful. The progress in the spinal fluid was similarly gratifying (see table). The urea and sulphadiazine were discontinued after July 28 when the second negative culture of spinal fluid was reported.

On Aug. 3 encephalography revealed moderate dilatation of the ventricular system, but no evidence of residual brain abscess; 60 c.cm. of air was used and the subarachnoid pathways did not fill. Neurological examination revealed no abnormality. The visual fields and ocular fundi were normal. There was difficulty with abstract thinking, but for all practical purposes the patient had made a complete recovery.

DISCUSSION

It is believed that *p*-aminobenzoic acid is essential for growth of bacteria and that sulphonamides, which have a similar chemical structure to this substance, are therefore taken up by the bacterial enzyme-system. How urea acts is not exactly known, but it has the same radicles in its molecule attached to a carbon atom as have the sulphonamides and *p*-aminobenzoic acid—the amine and the carboxyl, or acid, radicle. In any event, in vitro,[2] combinations of sulphonamides and urea possess a bacteriostatic effect even in the presence of the sulphonamide inhibitor, *p*-aminobenzoic acid.

Urea is a diuretic, so it is especially important to maintain an adequate fluid intake in patients who are receiving it. The sulphadiazine level in the blood in this case ranged from 7 to 9 mg. per 100 c.cm. at a time when the patient was receiving 2 g. of sulphadiazine and 1·2 g. of sodium bicarbonate every four hours. Most of our patients who receive such dosage of these drugs run a blood level of sulphadiazine between 13 and 15 mg. per 100 c.cm. The relatively low level in this case can probably be attributed to diuresis induced by the urea.

In two other patients who had bone fragments removed from the brain, bacterial cultures revealed gram-negative bacilli (*Bact. aerogenes*) in addition to gram-positive organisms. A watertight closure of the dura was made in each case, and 30 g. of urea was given by mouth every four hours for 3 and 4 days respectively, in addition to the usual postoperative courses of penicillin (20,000 units intramuscularly), and sulphadiazine (1 g. by mouth four-hourly). There was no evidence of intracranial sepsis in either of these cases several weeks after the operation. These experiences bring out the possibility of primary watertight dural closure, even in the presence of gram-negative organisms. Since the advent of penicillin, Cairns [3] has clearly recognised the growing significance of these bacteria in the brain.

Urea and sulphanilamide have also been used topically in a few cases of brain fungus with gram-negative bacilli without notable success in eliminating these organisms from the surface of the wounds. The systemic administration of these drugs, however, does seem to prevent the development of encephalitis and ventriculitis from these organisms which had occurred in other cases where urea was not employed. Further work along these lines is required before positive conclusions can be drawn.

2. *Loc. cit.* p. 247.
3. Cairns, H. *Proc. R. Soc. Med.* 1944, **37**, 371.

SUMMARY

A case of meningitis due to *Bact. coli*, which failed to respond to sulphadiazine and penicillin, recovered after receiving 2 g. of sulphadiazine and 30 g. of urea introduced into the stomach every four hours.

ALLERGIC REACTIONS TO PENICILLIN

A. NEISH BARKER, MRCS
MAJOR RAMC

ONE of the main characteristics of penicillin is its lack of toxicity (Florey and Jennings 1944); untoward reactions have been thought to be due to impurities. Lyons (1943) reports an urticarial reaction in 12 out of 209 patients receiving penicillin therapy, 1 case having had local applications only. Pyle and Rattner (1944) record a case of dermatitis venenata in a doctor responsible for preparing and administering penicillin in a general hospital; the three medical orderlies who subsequently handled the penicillin also experienced slight itching of the face and penis, though no dermatitis developed. The two cases of skin reactivity to penicillin, or other products of *Penicillium notatum*, here reported also illustrate the skin lesions that may arise from handling penicillium products or from intramuscular injections of penicillin.

CASE 1.—A medical officer in charge of the penicillin laboratory at a large military hospital had handled penicillin for 7 months under laboratory conditions without ill effect. In September penicillin solutions were required at the rate of three to eight million units a day. Each bottle had to contain 200,000 units, so it was necessary to transfer the dissolved contents of one bottle to another. The doctor did this with a syringe and some of the solution leaked past the piston of the syringe on to his hands. The day after the first dispensing he noticed a pruritus of the shaving area but this was dismissed as a shaving rash due to a blunt razor-blade. Two days later he went on leave and the irritation disappeared without any local treatment. On his return he continued to dispense the penicillin solutions, and within 2 days developed an acute dermatitis of the face and neck which was accompanied by œdema of the upper and lower eyelids and a feeling of tightness of the rest of the skin of the face. No other area was affected. Next day vesiculation with a serous exudate was observed on the chin. Shaving soap was considered as a cause at first but it was thought that the distribution was so extensive, involving areas unlikely to have come in contact with the soap, that some other irritant was responsible. There was no irritation of the fingers or hands but direct transfer of the penicillin by the fingers to the face seemed possible. As a precaution the patient stopped dispensing but continued laboratory work with penicillin. The rash subsided within a week with twice daily applications of lotio calaminæ and by restricting shaving to a minimum.

When all clinical signs of dermatitis had disappeared patch tests were performed with a solution of penicillin as dispensed (20,000 units per ml.) and as a control with a solution of the same concentration which had been autoclaved. The penicillin solution produced an eczematous reaction within 12 hours, and the site showed pigmentation 2 weeks later. The control was negative. Photosensitisation, often seen in sulphonamide dermatitis, was not observed.

Strong solutions of penicillin have a distinctive odour, described as reminiscent of urine-soiled baby's napkins; the patient reported that some hours after he noticed the smell the skin of his face began to itch. He had noted this on several occasions. It is possible that the irritant is volatile since the solution becomes innocuous on autoclaving. If this is so it would account for the selection of the face as the site first attacked. Incidentally, the solution which was pale yellow turned a dark brown in the autoclave, suggesting chemical change. The irritant cannot be identified with certainty because present-day products contain substances other than penicillin, though judged by its colour the penicillin

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powder used at this hospital was of a high degree of purity.

The doctor had not experienced an allergic reaction before, or suffered from eczema. There was no evidence of fungus infection which might have rendered him sensitive to a mould product occurring as an impurity in the penicillin.

CASE 2.—A man aged 25 attended hospital with a giant urticarial reaction on the trunk and extremities. He was wounded in the right forearm in Normandy, and after surgical toilet was treated with intramuscular injections of penicillin for 4–5 days. At the end of this period he developed an urticaria which had persisted for 4 weeks. The dose and make of penicillin are not known.

He was covered with large confluent weals on the trunk and extremities and exhibited dermographism. He said he had never suffered with any skin disease. Scratch and intradermal tests were performed using 0·1 ml. of penicillin solution of the same strength as in case 1, this being thought to be the strength injected originally; the same solution was autoclaved as a control. Within half an hour the penicillin solution produced an urticarial weal but the control had no effect. The weal persisted for 24 hours and slowly disappeared. There was no evidence of current fungus infection.

Personal idiosyncrasy cannot be entirely ruled out in these cases, but the delay in onset of the symptoms is significant. Sensitisation due to a previous fungus infection is a possibility in both cases but in sixty-odd men treated locally with penicillin neither dermatitis nor urticaria was observed. It is unlikely that all of those men had escaped tineal infection in view of its wide distribution and therefore it is improbable that this factor played any part in the two cases reported here. The absence of reactions to penicillin in the patients treated by local applications may be due to the weak concentration used (200 units per ml.).

Patch-tests of penicillin solution of the same strength as in case 1 were applied to the dispenser to whom the preparation of the penicillin was to be relegated. Both test and control were negative. As a precautionary measure he was instructed to wear rubber gloves. He has shown no ill effects.

SUMMARY

Two cases of skin reaction to penicillin are described—a dermatitis venenata and an urticaria. Both have been confirmed by positive reactions to cutaneous tests. Controls, using the same strength of penicillin modified by autoclaving, were negative.

I wish to thank Brigadier R. M. B. MacKenna and Colonel F. R. Laing for permission to publish this article.

REFERENCES

Florey, H. W., Jennings, M. A. (1944) *Brit. J. Surg.* **32**, 112.
Lyons, C. (1943) *J. Amer. med. Ass.* **123**, 1007.
Pyle, H. D., Rattner, M. (1944) *Ibid*, **125**, 903.

EFFECT OF RUBBER TUBING ON SOLUTIONS OF PENICILLIN

S. T. COWAN, M D, DIPL BACT. MANCH.
MAJOR RAMC

INTRAMUSCULAR infusion appears to be the method of choice for systemic penicillin therapy; the thrombosis of veins associated with intravenous treatment, and the disturbance of the patient for repeated intramuscular inoculations are avoided, and an adequate blood concentration can be maintained throughout (Morgan et al. 1944). The volume administered however must be kept small, which is a disadvantage because the flow is so slow that the needle readily blocks, and the penicillin solution is kept in contact with the rubber tubing for several hours. The object of this paper is to show that some samples of rubber tubing are unsuitable for use in the infusion apparatus because they inactivate some of the penicillin in solution.

EXPERIMENTAL

Assay of penicillin.—All assays except those in section 4 were made on at least 16 plates. In experiments 1 and 2 the Oxford method (Heatley 1944) and a modification of Schmidt and Moyer's method (1944) were run in parallel; in the other experiments the Oxford method was used. A large-scale experiment to determine the error of the method in my hands showed that for one solution it was about 15% (coefficient of variation 6·3) when 4 plates were used and about 7·5% (CV = 2·8) with 16 plates. Allowing another 7·5% for errors of dilution (a separate pipette was used for each decimal dilution) the total error is probably about 15% for a 16 plate assay.

Sterility tests.—One ml. of each solution of experiments 4 to 7 was inoculated into broth containing sufficient penicillinase to inactivate the whole of the inoculum. The penicillinase was kindly supplied by Surgeon Lieut.-Commander H. W. Clegg, RNVR.

1. *Natural rubber tubing.*—Narrow tubing (3·5 mm. in diameter) made of natural rubber was cut up into 1-inch lengths, of which one was sterilised by boiling for 15 min., another by autoclaving at 5 lb. for 30 min., and a third at 15 lb. for 15 min., but the way in which the tubing was sterilised made little difference to the results of the tests to be described. The sterilised pieces were placed in small screw-capped bottles containing penicillin solution,

TABLE I—ASSAY OF PENICILLIN SOLUTIONS AFTER CONTACT WITH RUBBER TUBING IN GLASS BOTTLES

Expt no.	Times sterilised	Duration of contact (hr.)	Temperature (° F)	Penicillin in units per ml.		
				Tubing sterilised by—		Control (no rubber)
				Boiling	Autoclaving	
1	1	24	67–75	787 (*98*)	752 (*94*)	800
2	2	24	64–69	588 (*100*)	456 (*78*)	587
3	13	0	66	. .	. .	1010
		2	67	925 (*98*)	870 (*93*)	940
		4	67	1020 (*95*)	1020 (*95*)	1070
		8	68	980 (*98*)	920 (*92*)	1000
		12	67	875 (*85*)	885 (*86*)	1030
		18	67	800 (*82*)	760 (*78*)	970
		24	68	730 (*72*)	660 (*65*)	1010

Figures in parentheses are percentages of the control solution.

and an additional bottle of the same solution was kept under the same conditions, but without rubber, as a control. Samples were removed from the bottles, diluted and assayed. The results (table I) showed (*a*) that in certain circumstances this tubing inactivated some of the penicillin solution in contact with it, (*b*) that the tubing had a greater action after repeated sterilisation than when it was new, and (*c*) that although the reduction in strength only became significant after twelve hours at room temperature the action probably started earlier and was progressive. The results also suggested that some of the penicillin used in continuous intramuscular therapy might be inactivated before it reached the patient.

2. *Bench tests of the "Eudrip 3" apparatus* (McAdam et al. 1944).—The first set received for trial was fitted with red synthetic rubber tubing. In these experiments an attempt was made to imitate conditions at the bedside. The reservoir bottle was fixed 4 ft. above the bench and the last 3 ft. of tubing was strapped to the bench; the needle delivered into a sterile separating funnel below bench level. The apparatus was sterilised in a theatre autoclave at 10 lb. for 10 min. A control solution was kept on the bench, and this was renewed when the reservoir bottle was changed. In experiment 5 sodium penicillin solution, freshly prepared daily, was run through the apparatus for 4 days at the rate of 100 ml. a day; on the fifth day the flow was slowed to 80 ml. in 24 hours to represent partial blockage of the needle. In addition to the control solution kept on the bench the contents of the solution remaining in the reservoir were assayed each day. The results of some of these experiments are shown in table II.

Several sets of "Eudrip 3" were received fitted with black rubber tubing which was soft and elastic and became sticky on autoclaving; bench experiments with one of these sets (experiments 6 and 7 in table II) showed no appreciable inactivation of penicillin.

3. *Trial of the "Eudrip 3" in treatment.*—One of the sets fitted with black tubing was used in the treatment of a patient by the intermittent method suggested by Bigger (1944). Whenever the reservoir bottle was changed a small bottle containing the same solution was strapped to the stand; 18–26 hours later a sample of solution was collected from the tubing near the needle by

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TABLE II—ASSAY OF PENICILLIN SOLUTIONS BEFORE AND AFTER PASSING THROUGH RUBBER TUBING OF "EUDRIP 3" SETS

Expt no.	Times sterilised	Sample collected after (hr.)	Penicillin in units per ml.		
			Needle	Reservoir	Control (on bench)
4	1	4–5	490 (62)	..	790
		8–9	425 (59)	..	720
		23–24	470 (66)	..	714
5	3	4½–5½	53·5 (52)	..	102·5
		20–21	55·75 (56)	102·5	100
		47–48	74·5 (66)	109 (96)	113
		71–72	78·6 (70)	108 (96)	112·5
		96–97	76·8 (76)	101 (100)	101
		116–117	81·6 (69)	116 (99)	117·5
6	1	3½–4½	711 (97)	..	784
		7½–8½	705 (92)	..	768
		21–21½	720 (88)	800 (98)	820
7	10	16–16½	968 (100)	..	968

Red rubber tubing was used in experiments 4 and 5 and black tubing in experiments 6 and 7.

means of a dry all-glass syringe, and this and the control solution were assayed. To determine the adequacy of the treatment urine and blood were collected and the bacteriostatic levels titrated (table III). Blockage of the needle was troublesome in the first course of treatment and occurred after approximately 18, 14, and 26 hours use. A wider needle was used subsequently. Three sets fitted with similar black tubing have been used on another patient, and samples from the tubing and the serum concentration have been satisfactory.

4. *Testing the suitability of rubber tubing for penicillin infusion apparatus.*—The variation in effect on penicillin of different kinds of rubber tubing necessitates a test to pick out the deleterious ones. Running strong solutions through the whole apparatus is wasteful of penicillin, and a simple test was made by immersing a 1-inch length of sterilised tubing in 10 ml. of penicillin solution containing about 100 units per ml. Together with a control of the same solution without rubber tubing the test bottle was placed in the incubator and assays on 4 plates were made after 3 hours at 37° C. This temperature was chosen because room temperature is variable and every laboratory has an incubator at 37° C; further, if the inactivation of penicillin is due to a chemical reaction it should be speeded up at the higher temperature. Red rubber from the apparatus used in experiments 4 and 5 (table II) and black tubing from the apparatus used for the observations of table III by this test gave values of 62 and 94% respectively of the control solution, figures which are in good agreement with those previously obtained.

DISCUSSION

The validity of any conclusions drawn from these experiments depends on the absence of contamination and the accuracy of the assays. The solutions of all the experiments recorded here were sterile but it was found that contaminated penicillin was inactivated even more quickly in the presence of rubber than in its absence. The 16-plate modification of the Oxford method of assay has a total error of about 15% so that any deterioration greater than that was probably real and not due to experimental error.

The Edinburgh workers (McAdam et al. 1944) and Osborne (1944) reported satisfactory serum concentrations in patients treated by intramuscular infusion; they were fortunate in their choice of rubber tubing. The first "Eudrip 3" sets supplied to the Army were fitted with tubing which inactivated 25–50% of the penicillin but this fault was quickly rectified. The tubing now supplied has no obvious deleterious action as shown by bench and bedside tests of the solutions in the tubing and by the bacteriostatic power of the serum and urine.

The colour of the rubber is probably without significance. Tests should be made on any tubing which is to come into contact with penicillin solutions, and samples producing appreciable inactivation should not be used. The rubber caps of bottles of powder supplied by one American firm have been tested by keeping a bottle inverted after the addition of sterile water so that the solution was in contact with the rubber cap; the rate of deterioration at room temperature ran parallel with that

TABLE III—ASSAY OF PENICILLIN IN TUBING NEAR NEEDLE AND BACTERIOSTATIC POWER OF PATIENT'S SERUM AND URINE DURING TREATMENT BY MEANS OF A "EUDRIP 3" FITTED WITH BLACK RUBBER TUBING

Sterilisation of apparatus	Hours apparatus in use	Hours bottle in use	Penicillin units per ml.		Serum	Urine units per ml.
			Control	Tubing		
First	26	26	4050	3800 (94)	1 : 8	80 (DM)
	50	24	3450	3530 (102)	1 : 8	Con.
	76	23	3690	3630 (98)	1 : 8	160 (DM)
Second	23	23	3675	3450 (94)	1 : 4	80 (DM)
	46	20	4600	4400 (96)	1 : 8	160 (DM)
Third	18	18	4320	4240 (98)	1 : 8	94 (OM)
	41	20	4200	4120 (98)	1 : 4	19 (OM)*
Fifth	17½	17½	4600	4640 (101)	1 : 4	160 (DM)
	42½	21	4640	4500 (97)	1 : 4	320 (DM)

DM = dilution method using doubling dilutions.
OM = Oxford method.
* Patient had polyuria at the time. Con. = contaminated.

of solution in another bottle in which it was not in contact with the rubber.

SUMMARY

Rubber was found to have a variable effect on penicillin solutions; some samples inactivated a considerable proportion of the antibiotic and others had no observable effect.

In continuous intramuscular infusion the long contact of solutions with the rubber tubing affords ample time for the destruction of 25–50% of the penicillin if the rubber is unsuitable.

A simple method of testing the rubber is described.

This paper is a summary of a series of reports to the Director of Pathology at the War Office, and I have to thank Major-General L. T. Poole for his permission to publish the findings and for his interest and help throughout the investigations. To Major Charles Gray, RAMC, I am indebted for freedom of action in treating and carrying out tests on his patient.

REFERENCES

Bigger, J. W. (1944) *Lancet*, ii, 497.
Heatley, N. G. (1944) *Biochem. J.* 38, 61.
McAdam, I. W. J., Duguid, J. P., Challinor, S. W. (1944) *Lancet*, ii, 336.
Morgan, H. V., Christie, R. V., Roxburgh, I. A. (1944) *Brit. med. J.* 1, 515.
Osborne, G. V. (1944) *Lancet*, ii, 407.
Schmidt, W. H., Moyer, A. J. (1944) *J. Bact.* 47, 199.

Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the section of epidemiology on Jan. 26, with Sir WELDON DALRYMPLE-CHAMPNEYS in the chair, a discussion on

Jungle Warfare

was opened by Brigadier N. HAMILTON FAIRLEY, FRS. Among troops fighting in the jungle, he said, sickness accounts for anything from 5 to 30 times as many casualties as battle injuries. The sick casualties fill hospital beds and increase transport difficulties, and thus disease becomes of first-class military importance to the Army commanders. Training in tropical hygiene is an integral part of the training for jungle warfare. Because so many diseases are transmitted by insects troops must be adequately clothed. The use of shorts had to be absolutely prohibited; they now wear trousers and gaiters which can be treated with anti-mite fluid, and protect the legs and ankles against the bites of mosquitoes transmitting malaria and dengue. In one 6-months campaign, malaria accounted for 60·8% of sickness casualties, dengue for 17·5%, dysentery and diarrhœa for 6·2%, scrub typhus for 2·5%, and skin diseases, PUO's, &c. for 13·0%. Sickness casualties outnumbered battle casualties in this campaign by 16 to 1.

In the Middle East in 1940, he said, they had been sent a small supply of sulphaguanidine from USA to treat bacillary dysentery cases; they were getting many cases of Shiga dysentery at the time. As the supply was limited they decided to give it only to the more seriously ill patients after the type of dysentery bacillus had been identified. This meant a delay of

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1–2 days before treatment was begun, but nevertheless the results were remarkably good; even cases with ulcers which had been chronic for 3–4 months cleared up in 7–10 days, and sigmoidoscopy showed the ulcers to have healed. Later, in New Guinea, when more supplies became available, they gave sulphaguanidine in the field, as soon as a man reported having diarrhœa, and this measure resulted in a great decrease in the numbers of beds taken up by dysentery patients. Dysentery is now a disappearing disease among Australian troops, and has a mortality of only 1 in 5000. Only 3 deaths from bacillary dysentery were recorded in New Guinea after the introduction of sulphaguanidine therapy; of these patients one had not been treated, one had pneumonia, and one proved at autopsy to have pyelonephritis. During 1942, troops were fighting over the Owen Stanley Ranges under great difficulties, and were forced to defæcate close to the jungle tracks. The whole area became polluted, and severe dysentery developed, hampering operations to such an extent that the safety of Port Moresby was threatened. All available sulphaguanidine was flown up to New Guinea from the mainland of Australia and was given to men with diarrhœa at every regimental aid-post along the line. Within 10 days the epidemic was controlled and the incidence of dysentery reverted to its previous level. If given at onset, the drug terminates the diarrhœa, often in 24 hours, and the organisms in the stools are rapidly reduced in number; this naturally helps to decrease the area of fæcal contamination and infectivity. Sulphaguanidine must be given in large doses, and though costly is effective and safe. The crystals secreted in the urine are soft and unlike certain other sulphonamides in common use it never forms hard concretions. Brigadier Fairley has never seen a case of anuria. The only toxic complications have been nausea, headache, and occasionally maculopapular rashes with or without mild fever. Exfoliative dermatitis or agranulocytosis have never been encountered.

The mortality from scrub typhus, he went on, is 8%. Virulence varies so that the mortality-rate may range from 0 to 30%. Larval mites are responsible for transmitting the infection from rodents, such as rats or field-mice, to man. The troops are taught to use anti-mite fluid on clothing and socks, and when this has been applied they can go where mites are abundant without being bitten. Blankets must also be treated and troops must be warned against taking off their clothes at night. There are patchy areas of high infectivity in the jungle. A rapid system of notification is needed, so that infective areas can be put out of bounds. No specific drug is available to treat scrub typhus. Similarly, there is no known treatment for dengue. The common mosquito to carry the infection is *Aedes ægypti*, but *A. scutellaris* has recently been proved experimentally to be a vector in New Guinea. The mosquitoes have fixed times for biting. Danger can be reduced by clearing the ground round camps, using insecticide sprays, and providing the troops with adequate clothing. They must be warned not to remove their shirts in the daytime during an outbreak. Febrile cases admitted to hospital must be treated day and night under a net.

Speaking of malaria, he recalled a group of 252 soldiers who had escaped from Rabaul and crossed the jungles of New Britain. The medical officer had taken with him all the quinine he could lay hands on. For the first 3–4 weeks he had had enough to treat his men, but during the next 4 or 5 weeks, after supplies had run out, 50 had died of malignant tertian malaria. In the campaigns in New Guinea throughout 1942, the admissions to hospital over 3–4 months about equalled the number of troops involved. In Australia they had investigated experimentally the value of prophylactic quinine on volunteers, giving some grains 5, and some gr. 10 daily. Neither dose was of any value in preventing malignant tertian malaria. In experiments with 'Atebrin' (mepacrine), they found that a breakdown with malignant tertian malaria could be prevented by a daily dose (0·1 gramme), and the blood remained free of parasites. If this dose was continued for 3–4 weeks after the last exposure to infection cure resulted. With benign tertian, however, though men who became infected developed no fever while taking mepacrine, they had a relapse as soon as the drug was stopped, even after long periods. Troops fighting in a malarious area can thus be prevented from breaking down with malaria by regularly taking mepacrine; when they are removed from the area and the mepacrine is stopped, those who have acquired a benign tertian infection will relapse. Troops who have been experimentally infected with malaria have been tested by being subjected to severe physical strain, cold, and anoxia; but even under these conditions malaria breakdown did not occur provided mepacrine was taken every day in the prescribed dosage. Knowledge of these experimental findings led to a tightening up of mepacrine discipline with most dramatic results. Between December, 1943, and November, 1944, the incidence of malaria in Australian troops in New Guinea fell from 740 per 1000 per year to 36. The death-rate does not exceed 1 in 3000.

DISCUSSION

The CHAIRMAN asked whether Brigadier Fairley had had any experience with the use of sulphasuxidine in dysentery; and whether the anti-mite fluid used was also a mosquito repellent.

Colonel P. G. STOCK referred to some of the forms of tropical clothing designed for jungle warfare, and especially to shorts with a turn-up which could be turned down at night and tucked into the stockings.

Mr. KENNETH MELLANBY, D SC, had been impressed, in New Guinea, by the way in which Brigadier Fairley had got the principles of prophylaxis over to his troops. Mepacrine was taken regularly by everybody, and the importance of proper clothing was regarded so seriously that he was himself taken into custody by a military policeman for not wearing gaiters after 5 PM. It is difficult, he found, to impress troops with the importance of prophylaxis when they are going into areas where the danger of infection is patchy. If the regulations are enforced while they are in a good area the civil population tell them that prophylaxis is unnecessary; they become slack, and it is hard to make them take prophylaxis seriously when they move on into a bad area. The Australians are fighting in hyperendemic areas and it is possible to insist on a stringent rule. He agreed that trousers are necessary in the jungle to protect against malaria and dengue, but he thought shorts treated with anti-mite fluid might be adequate for those wishing to avoid scrub typhus, because the mites only bite covered parts. Wearing clothes treated with anti-mite fluid, he had lain for more than an hour in grass, watching the mites on his boots. Not one bit him.

Brigadier GEORGE MACDONALD agreed with Dr. Mellanby about the difficulty of getting troops to take mepacrine regularly when they have moved from a good to a bad area. He thinks it better to withhold mepacrine until they can be assured that they are now at risk. He mentioned a division, sent to Italy, who were believed to be taking mepacrine regularly. They were sent on a bad journey, and for four hours these 17,000 men were exposed to malarial infection in the Pontine marshes; 500 went down with it. This would never have happened if they had not heard too often the cry "Wolf, wolf."

Dr. R. A. O'BRIEN asked whether mepacrine had been continued indefinitely with any groups of soldiers exposed to benign tertian, to see whether the relapse could be avoided entirely.—Mr. A. FELIX, D SC, FRS, suggested that specific serum for scrub typhus has not been given a real trial.—Sir WILSON JAMESON paid a tribute to the work done by Brigadier Fairley. These Army studies, he said, will make some parts of the tropics much more bearable for Europeans after the war. The fear of malaria has almost gone if we can keep a big Army free of it.—Dr. HUGH STANNUS reminded the meeting that it has lately been shown that we manufacture our vitamins with the aid of the flora in our cæcum. By killing the organisms with sulpha drugs we may cause a vitamin deficiency. He asked whether Brigadier Fairley had seen any cases showing such symptoms.

The CHAIRMAN asked whether there were prospects of any light being shed on the cure of benign tertian malaria. He had seen famine cases in Calcutta come into hospital suffering, apparently, only from malnutrition. When they began to recover from their starvation they were apt to develop other diseases, such as malaria, which had seemingly been suppressed by

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the famine symptoms. Was this, he asked, a little akin to the suppression of benign tertian by mepacrine.

In replying, Brigadier FAIRLEY said that both sulphaguanidine and sulphasuxidine were specifics for the treatment of dysentery, but so far he had made no comparative tests of the two drugs. Their great value was that they were not associated with renal complications and could be used in dehydrated patients. He had seen no cases of vitamin deficiency following sulphaguanidine. In the South West Pacific no drug known had had any effect on the relapse-rate of benign tertian malaria. In the Middle East 70% of cases had been cured with standard quinine, mepacrine, and pamaquin. Evidently these two strains of *Plasmodium vivax* responded differently to therapy. He undertook to test scrub-typhus serum if Dr. Felix would let him have supplies.

SOCIETY OF MEDICAL OFFICERS OF HEALTH

AT a meeting of the fever group on Jan. 12, with Dr. M. MITMAN in the chair, a discussion on

Malaria in this Country

was opened by Mr. P. G. SHUTE (malaria officer to the Ministry of Health). Malaria, he said, was endemic in England as late as the 19th century and reached epidemic proportions in certain areas. In 1917 330 cases arose from infection of anopheles by soldiers returning from abroad; cases were also numerous in 1918, but from 1920 onwards there were very few. In England the only anopheline species likely to be important in malaria transmission is *A. maculipennis*, which is most densely distributed in low-lying marshy districts, and *atroparvus* is the variety medically most important.

Mr. Shute estimated that possibly hundreds of thousands of malaria-infected troops will return to this country at the end of the war, making the spread of malaria to the civil population a foregone conclusion. This prospect, however, is less formidable than it seems. Infection with *Plasmodium ovale* is readily cured, shows no tendency to relapse, and should not trouble us in post-war years. *P. malariæ*, although it survives in man longer than any other species, is not easily transmitted, since gametocytes (sexual parasites) are rare. European strains of malignant tertian (MT) infections readily infect English anophelines but usually die out in the mosquito before the cycle is completed, unless the atmospheric temperature is 75° F or over. In addition the attack in man is fairly readily cured and often burns itself out within six months. Only one indigenous case of MT malaria was reported in this country after the last war. In benign tertian (BT) infection relapses are common and parasites are available to the mosquito in the peripheral blood for some days before clinical relapse. The parasitic cycle can be completed even at low temperature, and heavily infected mosquitoes can remain infective after they have fed as often as 30 times. Infected varieties normally living in close association with man can therefore give rise to many cases of malaria. Mosquitoes infected in early summer are potentially less dangerous, since they have to pay frequent visits to the breeding-grounds and many are drowned in the process. BT malaria, therefore, is the one most likely to arise as an indigenous infection in this country. With high atmospheric temperatures a few cases of MT infection might arise from European strains, but returning troops should not be infective to mosquitoes for more than a single summer. Nevertheless, rapid diagnosis and prompt treatment of indigenous cases is of the utmost importance in view of the known virulence of this species, particularly in a non-immune population.

In BT infections prophylactic mepacrine offers transient protection only. Returning troops so protected may have their first attack of malaria many months after arrival in this country, and relapses will be frequent.

The first step in any antimalarial measures is treatment of the sick. Neither quinine or mepacrine has gametocytocidal properties, which is the important factor as far as infectivity to the mosquito is concerned. Pamaquin in small doses of 0·02 or 0·03 g. will destroy gametocytes in 24 hours and can be given on the first and second days of relapse. Mepacrine should not be administered at the same time, but quinine can be used. The value of the mosquito net should be borne in mind, especially in districts where *A. maculipennis* is abundant. Destruction of a few mosquitoes in the house where a case of malaria has occurred will probably do more to prevent the disease spreading than the destruction of hundreds of thousands of mosquito larvæ in their breeding-grounds. Action against breeding-grounds is useless at the end of the summer or early autumn, when most indigenous malaria infections are contracted in England, because active breeding will then be over for the year. Measures against the adult insect are preferable to antilarval operations. The insecticide should kill instantly and leave no smell; otherwise mosquitoes may be driven from animal-houses to enter human dwellings. A number of new insecticides are available; DDT appears extremely promising against mosquitoes, but final judgment on its effectiveness should be reserved.

Mr. Shute pleaded for early diagnosis in indigenous cases and for taking a blood-film in suspected cases before giving antimalarial drugs. One thin and one thick film should be taken—the first spread so that the red cells almost touched without overlapping. A thick film should be spread over an area the size of a sixpence and just so thick that newsprint can be seen through the drop of blood when the slide is lying flat on it.

Dr. E. MCCALLUM (EMS) described 48 cases of BT and 1 case of MT malaria in soldiers back from the Middle East. All were mild and with typical clinical courses. Twelve of the cases gave no history of previous attack while in the malarious area. In the diagnosis of a primary attack relative monocytosis is suggestive. Treatment was on standard lines with quinine, mepacrine, and pamaquin, and could usually be completed within three weeks. No toxic effects were encountered. As the hospital is in an area potentially malarious owing to the presence of *A. maculipennis atroparvus* with suitable breeding-grounds, precautions recommended included the use of mosquito nets, pyrethrum spraying, and administration of a dose of pamaquin to the patient. No case of indigenous malaria had occurred in the surrounding population.

LABORATORY DIAGNOSIS OF MALARIA

Major J. W. HOWIE, RAMC, said that thin films must really be no more than one cell thick or the stain will not penetrate properly. Thick films are often made too thick; one or two drops of blood are enough—not six or seven as some of the books advise—and the blood should be spread gently and evenly so that the hands of a watch can be seen through the dried specimen. Personally he prefers Leishman's stain for thin films and Field's or Giemsa's for thick. One point is often overlooked: the distilled water must be adjusted to a reaction near neutrality; otherwise malaria pigment and stippling will be missed and species differentiation will be harder. This matters, because prevention of relapses in MT malaria can best be ensured by giving mepacrine, whereas in BT malaria quinine and pamaquin will give better results.

From each case of suspected malaria, a thick and thin film should be made. The thick film is essential when parasites are few; the thin one is needed to determine species. Clinical suspicions should be readily aroused if disasters are to be avoided. Malaria should be suspected in any soldier who has been in an area where the disease occurs. Classical symptoms must not be waited for to make a diagnosis; often the man developing MT infection is aware of no more than a "hangover" that is not caused by alcohol.

It is sometimes mistakenly supposed that blood-films should be taken when the temperature is rising; but the chances of detecting parasites are highest if they are made when the temperature is falling, and absence of pyrexia is by no means a reason for not making a film.

The best practice is to make several films at intervals of 3–4 hours; 5 minutes' examination of four films made at these intervals is far more useful than the prolonged scrutiny of a single film. There should be no half measures about the interpretation of films. The report "? parasites" is a confession by the microscopist that he needs expert help. A properly stained film shows unequivocal red and blue staining in the structure of parasites. Unless an object in the film shows this, it

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is not a parasite. People who find it difficult to distinguish platelets from parasites are not qualified to attempt the laboratory diagnosis of malaria. Doubtful structures, or much polychromasia, indicate the need for examining more films. In grave malarial infection—cerebral malaria and blackwater fever, for example—it may not be possible to demonstrate malaria parasites in the peripheral blood.

The laboratory worker can offer useful help in controlling therapy by estimating the concentration of antimalarial drugs in blood and urine. Some of this work can be done only in special laboratories, but there is one useful and simple test that any laboratory can perform—the Tanret test for quinine in the urine (*Lancet*, 1943, ii, 317). If this is not positive during quinine administration, the attack will not respond; either the patient is evading the drug, or his absorption is defective, or his tissues are destroying it with undue rapidity. A persistently positive Tanret in successive urines will soon be followed by a good clinical response; but if the Tanret is negative or irregularly positive, quinine or mepacrine must be given parenterally.

It is dangerous to wait too long in serious MT infections before giving parenteral quinine, which is still the best remedy for cerebral malaria. In blackwater fever, of course, quinine should not be given, but if there is any difficulty in controlling severe MT infections there must be no delay in giving intravenous or intramuscular quinine. Improvement is usually dramatic, and a patient who has previously vomited the drug can often take and absorb later doses given by the mouth.

A patient whose malaria has rendered him anæmic (red cells below 2½ million) will show a reticulocytosis of 10–20% over three days or so when his infection is fully controlled. If this reticulocytosis fails to appear in an anæmic patient, or a submaximal response (4% or thereabouts) is noted, the infection has not yet been fully controlled.

If the clinician and pathologist will tackle malaria together with knowledge and intelligence, they will be able to do much to curtail its effects, and many disasters will be prevented.

DISCUSSION

Dr. C. A. BENTLEY thought that Romanowsky stain is more stable in tropical conditions with high humidity than Leishman's, but Mr. SHUTE attributed failures of Leishman's stain to the use of acid distilled water.

Dr. BENTLEY wondered whether any steps are being taken to get the after-histories of known cases of malaria, for the disease is sometimes very difficult to eradicate completely. The persistence of malaria in a locality depends on the ratio of mosquitoes per head of population. Thus in this country the disease will be very unlikely to spread in big towns but might do so in sparsely populated areas.

Dr. E. H. R. HARRIES (LCC) said that the precipitating factor in an attack is often a change of environment or conditions, and we must be alive particularly to the possibility of cerebral malaria in troops returning from abroad.—Dr. E. C. BENN (UNRRA) described the rapid deterioration of such a case in a hospital in this country.—Dr. R. A. O'BRIEN wondered whether men returning from abroad could be accepted as blood donors, and it was agreed that the risk of their transmitting malaria must be borne in mind.

In conclusion, Mr. SHUTE emphasised the value of taking diagnostic blood-films when the temperature is normal. This applies particularly to MT infections but also to BT malaria where the parasite is larger in fever-free intervals.

Reviews of Books

Surgery

A Textbook for Students. CHARLES AUBREY PANNETT, B SC, MD, FRCS, professor of surgery in the University of London at St. Mary's Hospital. (Hodder and Stoughton. Pp. 740. 35*s*.)

FOR one man to provide a new surgical textbook during war-time is an act of courage and diligence. Professor Pannett is particularly well equipped for this task: as a full-time teacher and an examiner, he knows the needs and understands the failings of students. Their fundamental need, as he recognises, is guidance. Ideally it would be proper to present all the facts and allow the student to draw his own conclusions, but in practice this merely produces the flounderer. Hence good teachers are usually dogmatic. All his life the student (especially in moments of stress) will recall his teacher's absolute: "Never do this" or "Never do that." Professor Pannett states his likes and dislikes clearly, but mentions rarities sotto voce, knowing well how difficult it is to convince the student that common things are common. The illustrations, from his own pen, are simple but serve their purpose. The book has balance: there is no need for the student to know the details of the abdominoperineal operation, pneumonectomy, or section of the sensory root of the gasserian ganglion, but he must be able to tell the examiner what these operations offer to his patient and what are the risks. He must know what he would do for acute appendicitis of over 72 hours' duration, how to deal with the acute retention, or what are the early symptoms of carcinoma of the stomach. Pannett tells these important things clearly and simply, and has packed more meat into the book than is at first evident. There are some blemishes, and some omissions, as he admits in his preface; but these are not fundamental and will soon be corrected. The book is said to be for the student, but we are all students, and with so much of our activities occupied with war surgery, it is well to admit that we may have grown a little rusty on less specialised work. This book, which can be read quite quickly from cover to cover, will serve as a refresher. It should be of special help to the doctor returning from the Forces who feels somewhat out of touch with civilian surgery.

Treatment by Manipulation

(4th ed.) A. G. TIMBRELL FISHER, MC, MB BRIST., FRCS. (Lewis. Pp. 224. 16*s*.)

THIS new edition is timely owing to the increased importance of manipulative treatment in war-time. Though the war has increased our awareness of the need to refer patients early to specialist orthopædic centres, the value of manipulation is still not generally appreciated. Many chronic cases might be cured in this way. The author's plea for a national rheumatism service is not likely to fall on deaf ears in the post-war years. His review of the pathology and clinical aspects of joint stiffness is sound, and is reinforced with good illustrations of manipulative technique and useful case-histories; but it is perhaps a pity that only a few lines are given to the prolapsed intervertebral disc in the discussion on sciatica, and that such procedures as stretching the sciatic nerve, and spinal manipulation for sciatic scoliosis, should still be described at length.

Cancer Primitivo del Pulmon

Estudio Clinico Quirurico. ERNESTO ESCUDERO. (Libreria Hachette S.A. Pp. 542.)

IT is not merely of academic interest that increasing numbers of cases of pulmonary cancer are being recognised nowadays. Patients should be diagnosed at the earliest possible moment if the possibilities of surgery are to be used for their advantage. Figures for pneumonectomy in this condition are sufficiently encouraging to suggest that great improvements in diagnosis and treatment may be anticipated in the course of the next few years. An up-to-date and comprehensive treatise on primary cancer of the lung is therefore acceptable. Dr. Escudero, who writes from the Argentine, produces a scholarly thesis embracing all branches of the subject. His personal experience is limited to some 40 cases, but he compensates for this by summarising, analysing, and quoting other workers on this subject. The text is lavishly supported by good illustrations. Perhaps the discussion on actual surgical and anæsthetic technique is too diffuse, and whereas no-one would deny the value of careful preoperative treatment the multiple injections and drugs advocated may seem excessive to some. If the views put forward are not wholly conclusive, divergent views are well set out, and the reader can draw his own deductions.

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THE LANCET

LONDON: SATURDAY, FEBRUARY 10, 1945

The Contracted Pelvis

"That methods of preventing rickets are already well known, and that rickets in its grosser forms is something of a rarity today, leads sometimes to an attitude of mind which supposes that the danger of rickets has ceased to exist, whereas, in fact, the condition is still prevalent in minor degrees. By being minor and 'masked' it is all the more dangerous to female children when they reach child-bearing age and are discovered to be suffering from contracted pelvis."

H. R. MACLENNAN,[1] in his Blair Bell lecture.

RECORDS from the industrial parts of Scotland show that rachitic deformities of the pelvis are distressingly common there and are still a major cause of obstetric disaster. Using the brim conjugate as a criterion, and counting only those cases in which the measurement was 3¾ in. or less—a strict definition, for this dimension normally averages more than 4¼ in.—MACLENNAN found that of 1049 women admitted to the Glasgow Royal Maternity Hospital no less than 15% suffered from pelvic contraction. When the cases were divided into three groups according to severity it was found that the slight cases were the most risky, for they tended to escape detection; and too often the woman concerned was allowed to continue dangerously long in labour, or was subjected to unskilled attempts at operative delivery before the nature of the case was recognised. Of primigravidæ suffering from contracted pelvis only 35% had spontaneous deliveries, whereas in a control group of normal women 85% had spontaneous deliveries. For multiparæ the corresponding figures were 39% and 97%. In primigravidæ with contracted pelvis the stillbirth-rate was 167 per 1000 live births, in contrast with 39 in the control group. For multiparæ the figures were 133 and 30. If cases of cæsarean section were excluded the stillbirth-rate rose to no less than 222 per 1000 live births in both primigravidæ and multiparæ with contracted pelvis. This represents for the multiparæ a fœtal and neonatal death-rate more than 7 times that of the normal group. These results were obtained by experienced obstetricians working in well-equipped hospitals. In an attempt to find corresponding figures for patients delivered at home, MACLENNAN obtained details of previous confinements of 812 multiparous patients with contracted pelvis who were admitted to hospital for subsequent deliveries. No less than 42% of all the children delivered vaginally were found to have died as the result of injury at birth. The weight of the child had a considerable influence on the outcome of labour. The average weight of the infants delivered spontaneously was, in the severe group, 6 lb.; in the moderate group, 6·6 lb.; and in the slight group, 6·7 lb. Among cases requiring craniotomy the average weight was 7·5 lb.—no more than the normal average for a full-time fœtus. A number of women with contracted pelvis did deliver themselves spontaneously even when the baby weighed more than 7½ lb., but according to MACLENNAN these patients had stronger uterine contractions and a greater endurance than normal. The cases in which this happens are few, but they are dramatic and therefore apt to be misleading.

The effect of pelvic contraction on the incidence of maternal mortality, trauma, and morbidity is no less important than its wastage of fœtal life. Indeed, the sum-total of suffering and death resulting from the legacy of infantile rickets is beyond estimation; and MACLENNAN's figures are a woeful reflection on the social conditions even now obtaining in our second greatest city, and in the industrial areas generally of Scotland. These facts together form one of the strongest arguments yet presented for the need of skilled antenatal care; for only by recognising every case of contracted pelvis before labour starts can provision be made for appropriate treatment. While pleading for wider provision of skilled diagnostic services, MACLENNAN emphasises the need for better diet and higher vitamin intake not only for the child and adolescent—whose requirements are already recognised—but also for the expectant, and especially the nursing mother; thus only can the incidence of rickets in future generations be expected to fall. He further recommends that radiological diagnostic services should be available for primigravidæ in whom the head has failed to engage by the 36th week. Multiparæ with a history of previous instrumental deliveries should be regarded with the greatest suspicion, even when those deliveries have been effected successfully, for the increase in weight of the child may readily turn the balance against the patient whose pelvis is only slightly contracted. North of the Caledonian Canal MACLENNAN found a complete absence of contracted pelvis. This is scarcely surprising if rickets alone is considered; his observations, based on clinical examination, seem to refer almost exclusively to the brim contraction characteristic of that disease. But other forms of pelvic contraction—probably the result of developmental variation rather than of developmental pathology—exist, and are indeed common, although they are frequently overlooked. Such contractions often occur at the "plane of least pelvic dimensions," or at the pelvic outlet, where many of them are difficult to detect. Some, such as the wedge-shaped (android) brim, can only be demonstrated satisfactorily by radiological methods.

In London MEAVE KENNY[2] has investigated 1000 obstetric cases at the British Postgraduate Medical School, using methods similar to those CALDWELL and MOLOY have made familiar, and has corroborated many of their findings. She has adopted the classification of pelvic types based on their theory of conflicting male and female tendencies during early development, though paying some heed also to the more anatomical nomenclature advocated by THOMS.[3] She found only 5 women with clear evidence of rickets. One was a London woman; 4 others came from the "depressed" areas of the North, of Clydeside, of South Wales, and of Ireland. How different are these findings from MACLENNAN's in the Scottish industrial centres!

Like other workers[4] KENNY found a fairly close relationship between general body build and pelvic

1. MacLennan, H. R. *J. Obstet. Gynæc.* 1944, 51, 293.

2. Kenny, M. *Ibid*, p. 277.
3. Thoms, H., Gruelich, W. H. *Amer. J. Obstet Gynec.* 1940, 39, 56.
4. Gruelich, W. W., Thoms, H., Twaddle, R. C. *J. Amer. med. Ass.* 1939, 111, 485.

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characteristics. For example, the thick-set woman, short-necked and broad-shouldered, is a notoriously bad obstetric subject. The term dystocia-dystrophia syndrome has been coined to describe this type of case, in which radiography shows that the pelvis is predominantly "android" in type. KENNY also noted some unexpected obstetric trends in association with the different pelvic types. Thus pregnancy toxæmia was 12 times as common in the "android" as in the "gynæcoid" group. Pelvic shape is probably partly an expression of racial characteristics; every one of the 48 Jewish women included in KENNY'S 1000 cases had a perfect gynæcoid pelvis. She supposes that pelvic type is inborn and recorded a fair resemblance between the shape of the pelvis in newborn children and in their mothers. In forecasting the character of labour, KENNY agrees with CALDWELL and MOLOY that more help is obtained from determining the pelvic type than from troubling with precise measurements. In particular, she believes that an absence of normal sacral curve, which reduces the posterior sagittal measurement of the mid-pelvic plane, is an unfavourable omen. Clinical measurement of the brim conjugate by digital examination she regards as highly unreliable. (It is, however, scarcely credible that the gross errors she mentions by way of example, such as 1 inch or more of under-estimation, could have been made by an experienced worker.) Operative interference in the various pelvic types was as follows: gynæcoid 13%; gynæcoid-android 20%; android 82%; android-gynæcoid 76%; pithecoid (anthropoid) 16%; platypelloid 66%; pathological types 80%.

While pelvic form undoubtedly influences the course of labour, it is difficult to suppose that ease of labour is not also intimately connected with pelvic size. This view was clearly expressed in a recent symposium on the radiological diagnosis of disproportion at the Royal Society of Medicine. ROHAN WILLIAMS,[5] CHASSAR MOIR, and NICHOLSON all emphasised the need for examination of the pelvis in two or more positions in order that measurement of the pelvis, or comparison of the pelvis with the fœtal head, could be obtained in terms not merely of the brim conjugate but also of other equally critical pelvic dimensions. MOIR[6] favours estimation of the areas available at the different pelvic levels. NICHOLSON[7] estimates that a brim of 110 sq. cm. can pass 99·9% of fœtal heads; one of 100 sq. cm. can pass 97%; and one of 90 sq. cm. can pass 70%; but one of 80 sq. cm. can pass no more than 21%.

How great a part radiological examination can or should play in influencing the conduct of labour is still difficult to decide. Such information is not used alone but is balanced with the many other features determined by older methods. The help of radiology in particular instances cannot be doubted. But as MACLENNAN says, "There are many fallacies associated with haphazard radiological pelvimetry, and the interpretation of the radiographs requires expert knowledge. It can be carried out most satisfactorily by a radiologist familiar with the radiographic technique, in association with an obstetrician who is accustomed to assessing the obstetric significance of radiographic deviation from normal. Wherever possible it is advisable to have the services of the radiologist available, not only for antenatal diagnosis but also for examination while the patient is in labour." With these words no-one can quarrel, and they give a clear indication of what must in future be regarded as an essential service in every obstetric hospital.

5. Williams, R. *Brit. J. Radiol.* 1943, **16**, 173.
6. Moir, J. C. *Edinb. med. J.* 1941, **48**, 361.
7. Nicholson, C. *Biometrika*, 1941, **32**, 16.

Intraperitoneal Chemotherapy

THE value of locally applied sulphonamides in wound therapy has been hard to assess, and this is true of intraperitoneal application. There are so many variables—the degree of contamination, the continuity of infection, the presence of dead tissue or sloughs, the time during which infection has had an opportunity to invade. But "all the people can't be wrong all the time," and nearly all the surgeons now treating abdominal wounds are favourably impressed. Moreover, it is hard to ignore evidence such as that of STAFFORD and his colleagues,[1] who have noted, in an experience nearing 1000 cases, that the mortality from perforated appendicitis has fallen each year as the use of intraperitoneal sulphonamides has increased.

The final issue of peritoneal infection, as STEINBERG and MARTIN[2] point out, mainly depends on two of the variable factors. The presence of dead material will favour bacterial multiplication and interfere with chemical attack. HALSTED demonstrated this deleterious influence of dead material many years ago. Organisms scattered into the peritoneum are rapidly dealt with by the body's defences, but it is a different story if there is any dead material around. With the second factor, continued reinfection by perforation or leakage, no local temporary chemical supply can cope. STEINBERG and MARTIN say we must revise our conception of peritonitis as a spreading infection, pushing back the defensive barrier in concentric circles from the site of leakage. They show experimentally that at an early stage such an infection diffuses throughout the peritoneal cavity—indeed it is this diffusion which enables the peritoneum to attack isolated groups of bacteria and destroy them. They find, though they cannot explain the reason, that organisms accumulate in greatest numbers in the right subdiaphragmatic fossa. We do not yet know the best way to apply sulphonamides intraperitoneally—some dust in the powdered drug; others inject it in saline through a small catheter inserted at operation—but these observations suggest the need for a wide scattering. Most British surgeons are using sulphanilamide or sulphathiazole, usually in doses up to 5 grammes, or at most 10 g. With bigger doses blood concentrations high enough to be dangerous may be obtained. Views differ on the optimal rate of absorption. Sulphanilamide is rapidly absorbed through the peritoneum, but its supporters hold that when adequate surgery has turned off the bacterial taps and removed the bacterial reservoirs the sulphanilamide will remain long enough to deal the remaining organisms a mortal blow. Moreover, sulphanilamide is not absorbed as quickly as is supposed; the blood-levels may be very high the next day, but a good concentration in the blood is usually still

1. Stafford, C. E., Beswick, J., Deeb, P. H. *Amer. J. Surg.* 1944, **64**, 227.
2. Steinberg, B., Martin, R. A. *Surg. Gynec. Obstet.* 1944, **79**, 457.

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found even on the third day, which suggests that the peritoneum still contains enough of the drug to be effective. At the recent meeting of the British Orthopædic Association Colonel ZOLLINGER reported that in the US Army it was the practice to dust 5 g. of sulphanilamide into abdominal wounds and they were well satisfied with its value. Sulphapyridine and sulphathiazole are locally more potent and remain longer in situ, but their insolubility may make them more liable to form small abscesses; OGILVIE,[3] from his Middle East experiences, disapproved of both. CHESTERMAN,[4] on the other hand, employed a suspension containing 0·15 g. of microcrystalline sulphathiazole per c.cm. in 20 cases of diffuse peritonitis of appendicular origin, with only one death, compared with a mortality of 20% among 75 similar cases treated without sulphonamides. This series—a large one to be collected by one surgeon—does not prove that the drug he used or its microcrystalline form was preferable to others, but his aqueous suspension has attractive physical properties: it does not cake, it is stable, with little tendency to settle, and it can conveniently be supplied in sterile tubes.

Sulphadiazine has been extensively used in the Middle East, and OGILVIE looks on it as the drug of choice, especially for the abdominal wound operated on late. In a small series of such cases intraperitoneal sulphadiazine reduced the mortality from 75% to 50%. Several opportunities have arisen for autopsies at varying times after wounding, and all showed an encouraging absence of infection, no adhesions, and no remnants of sulphadiazine. GIBLIN[5] injected sulphadiazine (10 g. suspended in 100 c.cm. of saline) through a separate catheter introduced at what appeared to be the height of possible infection, and repeated the injection daily for a further two or three days. He was pleased with the results, and was particularly struck by the fact that retroperitoneal hæmatomas failed to flare up after such instillations. We have not yet heard much about the use of the more soluble sulphamezathine in the peritoneum, but this drug, mixed with penicillin, is being used by the neuro-surgeons, who find that it does not produce convulsions when applied to the brain, as does sulphathiazole.

It is difficult to predict the future of penicillin in peritoneal infections. The intra-abdominal route would be the one of choice, because the drug does not pass through serous membranes, so systemic administration has no local effect. Its use by any route is not immediately attractive, for peritonitis is most commonly caused by organisms which are not only resistant to penicillin but also tend, at least in vitro, to destroy it. A gross mixed infection however may contain susceptible elements whose elimination would materially aid the patient's chances. Whether the inactivation of penicillin by resistant organisms would be sufficient to prevent its having any useful action on the sensitive ones will be for empirical trial to decide, when penicillin can be spared from cases where its benefit is more certain. KALISOVA[6] reports one case of very severe peritonitis with a mixed infection from appendicular gangrene which was successfully treated with penicillin run in through the drainage-tube every 3 hours, 280,000 units in all. This treatment was not started till over 24 hours after operation, when the child was desperately ill, going downhill, and not responding to sulphapyridine. As LOCKWOOD and his colleagues[7] remark, it is in cases of "primary" pneumococcal and streptococcal peritonitis that penicillin should prove valuable. In peritonitis following appendicitis they would expect success only in occasional cases which are bacteriologically favourable.

3. Ogilvie, W. H. *Ibid*, 1944, **78**, 225.
4. Chesterman, J. T. *Lancet*, 1944, **ii**, 407.
5. Giblin, T. *Aust. NZ J. Surg.* 1943, **13**, 37.
6. Kalisova, M. *Brit. med. J.* 1944, **ii**, 598.

Annotations

PENICILLIN IN THE UPPER RESPIRATORY TRACT

SURGEONS of the United States army and navy were among the first to use penicillin in quantity, and some instructive experiences of its effect in throat and ear infections have lately been published.[8] Several of those contributing to the symposium are each able to describe the treatment of a number of cases of osteomyelitis of the frontal bone, lateral sinus thrombosis, and other serious complications of disease of the upper respiratory tract, as well as hundreds of cases of acute otitis media. Most of the cases treated were acute infections, and resolution was more rapid than it is with sulphonamides. As general principles it was agreed that penicillin should be given early in the illness, in full doses, and that, to prevent possible relapse, its use should continue after the patient has appeared to recover. These are of course the general rules for all forms of chemotherapy. There was a distinct feeling that penicillin, like sulphonamides, reduces complications in both frequency and severity, and a number of infections resistant to sulphonamides responded to penicillin. Sulphonamides are easier to administer, since penicillin must be given by injection; but more organisms are susceptible to penicillin. It was agreed that the susceptibility of the organism should be determined bacteriologically, and emphasis was laid on the maintenance of the patient's nutrition, especially a positive nitrogen balance.

The more severe infections, it is suggested, should be treated by continuous intravenous injection, because a higher blood concentration can be obtained. But a large proportion of the intravenous dose promptly appears in the urine; and though intramuscular injection cannot achieve quite so high a blood concentration, it maintains a good level more evenly and longer. The dosage varied from 15,000 to 25,000 units intramuscularly every three hours; or frequent intramuscular injection was avoided by using a continuous drip. Swanson and Baker closely followed the method employed by the Floreys[9] in treating acute mastoiditis. After operation a rubber tube was left in the mastoid cavity, leading from the antrum to the lower end of the wound which was then sutured completely down to the tube. Penicillin solution (1000 units per c.cm.) was instilled into the cavity through the tube and this was then sealed. Every six hours the exudate was aspirated from the cavity, fresh penicillin was instilled, and the tube was again sealed. No free drainage was allowed. The tube was usually removed between the 4th and 7th days, and the ear was dry and the wound healed about 8 days from operation. Putney used penicillin freely in 7 cases of osteomyelitis involving the frontal and maxillary bones as well as 3 cases of orbital cellulitis. He found that the acute spread of osteomyelitis can be checked with large doses of penicillin, and he believes that the disease may be stopped and healing may take

7. Lockwood, J. S., White, W. L., Murphy, F. D. *Ann. Surg.* 1944, **120**, 311.
8. Swanson, C. A., Baker, D. C. *J. Amer. med. Ass.* 1944, **126**, 616; Putney, F. J. *Ibid*, p. 620; Report of discussion, *Ibid*, p. 621.
9. Florey, M. E., Florey, H. W. *Lancet*, 1943, **i**, 387.

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place without radical surgical measures if enough of the drug is given early enough. He does not say whether he used penicillin locally in the cases on which he operated. But most of the contributors to the special penicillin issue of the *British Journal of Surgery* held that penicillin often fails to control sepsis fully and may not diminish the incidence of chronic infection; and though it is a valuable accessory, good results from mastoidectomy depend primarily on the care and completeness with which the operation is performed.

A few patients with chronic otorrhœa were successfully treated by local instillation, but others did not respond. Swanson and Baker suggest that suitable cases are those with a large perforation and no granulations or cholesteatoma, the infecting organism being penicillin-sensitive. These are essentially cases of eustachian catarrh or perhaps middle-ear mucosal infection, and can be successfully treated by simple cleansing and insufflation or instillation of weak disinfectants (Banham [3]). Collins and Hughes [4] used penicillin in a small group of cases and came to a similar conclusion.

Penicillin given systemically is clearly valuable in all acute infections of the upper respiratory tract in which the causal organism is sensitive—the great majority. Applied locally in these cases it assists the healing of operation wounds, provided the operation itself has been thoroughly performed. In chronic disease its use, either locally or systemically, is of far less certain value and is unlikely to replace surgical removal of carious bone.

MYOCARDITIS IN CHILDREN

IT is in the acute infective diseases that myocarditis is most likely to arise, and Neubauer's review [5] of 200 cases in children therefore was appropriately from the City Hospital for Infectious Diseases, Newcastle-on-Tyne. Increasing use of the electrocardiogram suggests that myocarditis may be present even when clinical signs and symptoms are slight, doubtful, or completely absent. Nevertheless clinical manifestations are often valuable. Vomiting is frequently the presenting sign, together with pallor and listlessness, and albuminuria. At this stage the first heart sound at the apex becomes diminished in intensity, and it may later become much weaker than the second sound, and even inaudible. Changes in rhythm take place, such as persistent tachycardia, and less commonly bradycardia, embryocardia, or gallop rhythm. Cardiac enlargement and a fall in blood-pressure may also be noted. Neubauer gives three electrocardiographic signs—a flattened T-wave which later becomes isoelectric and eventually inverted; an S-T segment below the isoelectric line in lead I or II or both; a diminution of voltage of the ventricular deflections to less than 1·5 mV in all 3 limb leads. In his 200 cases these signs led to a diagnosis of myocarditis in 24% without clinical signs. In 20% the electrocardiogram confirmed doubtful clinical signs; and in the remainder clinical manifestations were sufficient. Of the whole series, 132 children had diphtheria, 40 scarlet fever, 24 whooping-cough, and 4 measles. Only 4% of the children died, but when the heart muscle is seriously affected, especially when a succession of infective fevers has caused repeated damage, heart disease may manifest itself in adult life. Neubauer does not discuss treatment but he rightly lays great stress on the need for adequate convalescence with complete rest and good nursing, a point on which all those concerned with rheumatic heart disease in childhood will agree. But the specific fevers and rheumatism are not the only causes of myocarditis in children. Saphir, Wile, and Reingold [6] from their experience of 97 autopsies in the practice of a general children's hospital, can report cases associated with meningococcal infection, poliomyelitis, pneumonia, bacterial endocarditis, and tuberculosis, as well as examples of "isolated myocarditis" without any apparent primary disease or infection elsewhere. Rheumatic myocarditis, of course, occurs in their series, and they also include examples of abscesses in the myocardium associated with various infectious diseases and different portals of entry. From autopsy material in children aged between 8 days and 16 years they contrast an incidence of 6·8% with 4% in adults. In addition to the post-mortem records they have clinical records of 60 cases, and a clinical diagnosis was made in only 10 of these, 7 of them having rheumatic heart disease. It is not surprising that they regard clinical diagnosis as difficult. Myocarditis should in their view be suspected if a patient with an infectious disease suddenly becomes worse, especially if there is a tachycardia out of proportion to the temperature. A feeble and often irregular pulse, cardiac enlargement, and low arterial blood-pressure are also given as important signs. Electrocardiograms had been made for 22 of the patients, and in 19 showed evidence (not described) of myocardial involvement. Evidence of heart-failure was noted in 32 and death was sudden in 9 out of the 60. Both from Chicago and Newcastle it is suggested that myocarditis in children might be diagnosed more frequently if it was looked for. The relatively high incidence recorded in children with rheumatic infection is probably explained by the fact that myocarditis is more often expected in that disease than in other acute infections.

GETTERING IN CANCER TREATMENT

IN their letter on another page two radio engineers ask whether a method used in valve manufacture for concentrating the effect of high-frequency currents into a small region might have applications to medicine. They suggest that a metal pellet should be followed by X rays along the alimentary tract until it reached the site of a tumour, when it could be made hot by bringing point electrodes or coils carrying radio-frequency currents near the patient. Whether intense local heating so produced would be capable of destroying a tumour has yet to be decided. If the metal is to be heated to vaporising point, as in gettering, intense burning would be likely. By less severe heating it might be impossible to produce the desired effect on the tumour without excessive damage to neighbouring regions. From the clinical point of view, the outstanding question is how such a pellet could be got to the appropriate spot in the body. Tumours of the digestive tract in which this might be attained in the way the engineers suggest are rare, and in most cases a surgical incision would be needed to reach the tumour site. It is doubtful whether the results would justify such measures in preference to ordinary surgical or radium treatment.

The use of high-frequency heating for treating tumours is of course not new. Dickens, Evans, and Weil-Malherbe [1] have shown that some animal tumours may be made to regress by applying local heat to a mass of tissue embracing the lesion, without any lasting damage to the normal tissues. Other workers have experimented on similar lines,[2] and there seems no doubt that desirable effects are produced by carefully controlled heating of a mass of tissue. The application of the method to patients with malignant tumours still needs careful investigation. The great advances made in ultrashort-wave technique during the war open up the possibility of well-directed heating even to deep-seated lesions, and may prove to have valuable applications in this field.

3. Banham, J. M. *J. Laryngol.* 1944, **59**, 117.
4. Collins, E. G., Hughes, K. E. A. *Ibid*, 1944, **59**, 81.
5. Neubauer, C. *Arch. Dis. Childh.* 1944, **19**, 178.
6. Saphir, O., Wile, S. A., Reingold, I. M. *Amer. J. Dis. Child.* 1944, **67**, 294.

1. Dickens, F., Evans, S. F., Weil-Malherbe, H. *Amer. J. Cancer*, 1937, **30**, 341.
5. Hass, M., Lob, A. *Strahlentherapie*, 1934, **50**, 345. Taylor, H. J. *Brit. J. Radiol.* 1936, **8**, 467.

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TREATMENT OF GOUT

COLCHICUM will always relieve the acute attack of gout, but in the interval between attacks the sufferer has for centuries been urged to adopt a multitude of unpleasant remedies—medicinal, dietetic, and physiotherapeutic. At last it looks as if his lot is to be ameliorated. We still cannot offer him a cure or a prophylactic, but apparently we can offer him freedom from restrictions on his mode of life—dietetic, alcoholic, or otherwise. Bauer and Klemperer[1] have come to the conclusion that, apart from the acute stage, treatment is of little avail and should therefore not be enforced. For the acute attack they recommend colchicine in full doses given as early as possible, combined with rest in bed. The failures with this sixteenth-century remedy they attribute to impure wines or tinctures. Colchicine seldom fails provided it is given early and generously. For cinchophen they can find no indications whatsoever; its toxicity may not be great, but there is no evidence that it is more effective than colchicine. They raise no objection to the popular preliminary catharsis, and recognise that in severe cases morphine or codeine may be necessary for the temporary relief of pain.

These workers can find no evidence in the tremendous literature of the subject that a low-purine diet has any effect on the course of the disease or in preventing or postponing acute exacerbations. They also doubt the efficacy of the fat-free diets recommended in recent years.[2] According to their own unpublished observations gouty attacks cannot be precipitated with any regularity by a high-fat intake, nor is the amount of fat in a well-balanced diet sufficient to cause significant retention of uric acid. Neither have they found the omission of fat from the diet beneficial in their cases. They have never been able to provoke attacks of gout by the administration of alcohol, and they have found attacks recurring in patients in spite of the banning of all such liquors. Their only restriction is that foods containing large amounts of purines should be avoided, but in this ban they include only sweetbreads, anchovies, sardines, liver, kidney, brain, and meat extracts. The diet, they suggest, should be balanced and contain adequate amounts of protein, iron, and vitamins. So far as drugs are concerned in the chronic stage they have no use for cinchophen, sometimes used on account of the lowering of the serum uric acid which it produces. This effect is obtained equally well by salicylates, but they cannot give salicylates the enthusiastic support given by Jennings,[3] a cautious view which is also shared by Hench.[4] The temporary lowering of serum uric acid produced by salicylates in large doses is liable to be balanced by retention once the salicylates are withdrawn; but in cases with frequently recurring acute attacks salicylates may bring some relief.

It may be depressing news for the gouty that their disease is incurable, but it will be some consolation that there is no point in their depriving themselves of the pleasures of the table, provided they do not carry pleasure to the stage of indulgence.

SUNSHINE AND TUBERCULOSIS IN CATTLE

TUBERCULOSIS is rare in cattle in most tropical and subtropical countries. This fact has in the past given rise to the statement that native cattle, such as those of India, are immune to the disease; but researches in the last few years have shown that as far as experimental tests are concerned there is no real immunity—it is a question of lack of opportunity for infection. Even in Great Britain, where the disease is common, its distribution is uneven. There are heavily infected areas and there are relatively free areas. Rainey[1] gives some figures for the distribution in Tasmania, where in his opinion there is less tuberculosis in cattle than in any other British country known to him. In his own district of about 400 square miles on the north-west coast, with about 2300 hours of sunshine a year, he has not found in more than three years of active clinical work a single case of bovine tuberculosis among animals bred in the district. During the same period, out of some 8000 bovines, largely cows, slaughtered in the local abattoirs, only 3 generalised cases were found. As regards tuberculin, a series of 412 cows yielded only one positive reactor. The experience of his veterinary colleagues has been similar. In one district there were only 14 reactors in 2475 cows tested; in another, 2 among 1200 cows; and in a third, 3·8% in a large group of 3396 cows; while autopsies for the most part revealed little or no naked-eye evidence of disease. Rainey attributes this immunity to two main factors—viz., continuous close-cropping of herbage, and the sunshine record. In his view keeping cattle out in the open all through the year is less important. In support of this he quotes his experience in the Fiji Islands where during 1919–20 he made a clinical examination of about 30,000 animals. The greater part of the Fijis consists of a wet belt of forest, but there is a sharply defined dry belt in the main island where the rainfall is less than half that of the wet belt. He found that whereas the incidence of tuberculosis among cattle in the dry belt was about 2%, that in the wet area was in the neighbourhood of 20%. These observations are consistent with bacteriological observations made in Great Britain, showing that tubercle bacilli can survive for long periods on pastures in the sunless wet winter months. Reasoning from his experience in Tasmania and the Fiji Islands, and the statistics of Queensland and South Africa, Rainey lays down what he believes to be the two essential requisites for serious human infection with tuberculosis of bovine origin—(1) a high local potential incidence of bovine tuberculosis showing, by a tendency to generalisation, a high virulence of the bovine bacillus; (2) a relatively sunless humid environment for the human being, favourable to mass infection, such as is found where there is overcrowding and underfeeding in dark ill-ventilated houses. Where these bad conditions do not obtain—where, to use Rainey's own words, "there is lots of sunshine, close cropping, plenty of animal food, no overcrowding, and a bovine tuberculosis either rare or of low virulence, as shown by a small tendency to generalisation and by 'non-visible lesions' at autopsy"—neither the cow nor its milk need be feared. Unfortunately these bad conditions *do* obtain in this country, and are likely to do so for a long time. Meanwhile with 5% of all milk samples, bacteriologically tested, containing tubercle bacilli we shall do well to continue pasteurising our milk.

Dr. S. E. GILL, who died at Hove on Feb. 2, was a former commissioner of the Board of Control and will be remembered for his investigations into feebleminded-ness. He was 74 years of age.

1. Rainey, J. W. *Vet. Rec.* 1944, **100**, 233.

1. Bauer, W., Klemperer, F. *New Engl. J. Med.* 1944, **231**, 681.
2. Bartels, E. C. *Ann. intern. Med.* 1943, **18**, 21.
3. Jennings, G. H. *Rep. chron. Rheumat. Dis.* 1937, **3**, 106.
4. Hench, P. S. Textbook of Medicine. Ed. by Russell L. Cecil. London, 1944, p. 600.

CHADWICK LECTURE.—On Tuesday, Feb. 20, at 2.30 PM, at 26, Portland Place, London, W1, Dr. J. D. Rolleston will speak on the war and infectious disease.

ROYAL SOCIETY OF MEDICINE.—At the section of psychiatry of the society on Tuesday, Feb. 13, at 2.30 PM, Dr. R. E. Hemphill will speak on testis function in schizophrenia and other mental disorders. On Feb. 15, at 5 PM, at the section of dermatology Dr. H. S. Stannus will read a paper on vitamin A and the skin. On Feb. 16, the section of radiology will meet at 6.30 PM to discuss radiotherapeutic technique in carcinoma of the larynx. The openers are to be Dr. J. L. Dobbie, Dr. S. Bryan Adams, Dr. Manuel Lederman, and Prof. B. W. Windeyer.

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Special Articles

SCIENTIFIC RESEARCH IN INDIA

LAST winter Prof. A. V. HILL, SC D, MP, secretary of the Royal Society, visited India to discuss and advise on scientific, technical, and research problems. The Government of India has now published his report.

He proposes that an Indian Scientific Office should be set up in London with specialists in agriculture, defence, engineering, industry, and medicine. Representative Indian scientists should be attached to the British Commonwealth Scientific Office in Washington, and young Indian teachers, research-workers, and members of technical staffs must be given facilities for advanced study abroad, especially in Britain.

In medical colleges full-time teachers and research-workers are essential in all subjects: staff, buildings, equipment, and salaries should be increased. An All-India Medical Centre should be established in Delhi where selected students, preferably graduates in other subjects, should be trained, receiving scholarships where necessary. The centre must be free from racial, religious, political, or provincial bias, since it is to provide the best type of teacher and research-worker, and thereby provide a high type of doctor throughout India. There should be a special hospital for the clinical study of malaria. Existing research institutes should now be brought into closer touch with medical colleges.

Statistics on the population of India require more accurate data and more detailed analysis, to guide the future direction of national development. The statistical work could be entrusted to the Expert Committee on Population. The great national resources of India are also inadequately known, and a Research Board on Surveys and Natural Resources should be set up. Agricultural research requires extension, particularly by trials on a large scale. All these proposals depend on an increase in trained workers, in equipment, and in expenditure. Funds must be found and plans for training developed in detail and put into practice as soon as possible. The headquarters staff assisting the Director of Scientific and Industrial Research in India is too small and quite inadequate for the work of the immediate future. A free post-war distribution to universities of surplus government scientific and medical equipment and machine tools would assist the universities at small cost, without the disturbance of existing essential trades which follows public sales.

A proper scientific organisation of research for the Fighting Services is essential not only for the present war, but for the future, when a self-governing India must maintain security from aggression. A Services Medical and Personnel Committee should be set up as a joint committee of the War Research and Medical Research Boards.

There should be a Central Organisation for Scientific Research, under a minister without ordinary departmental duties. This should have six boards—for medical research, agricultural research, industrial research, surveys and natural resources, engineering research, and war research. Each board would have a director as secretary and principal administrative officer, who would be ex officio a member of the other five boards. The members of the boards would be research scientists, and not more than an equal number of professionals. Each board would appoint committees whose chairmen would be encouraged to take initiative: joint committees would be appointed for special subjects. There would also be a Research Grants Committee and a Research Studentships Committee, set up by the six boards jointly. Research should be brought into a single organisation and existing government research institutes transferred, perhaps gradually, from their present departments to the Central Organisation.

An Indian Central Register for Scientific and Technical Personnel should be constructed, and the pay and status of scientific workers in government service should be raised to a level comparable with that of workers in universities and industry.

India requires a central scientific academy of the same type as the Royal Society of London. The body best suited for this purpose is the National Institute of Sciences of India. The Government of India should assist the specialist scientific societies in various ways without diminishing their independence. As scientific research in universities is the basis of scientific progress, a national policy with regard to grants to universities is necessary; medicine, biology, and geology particularly need development. Research, however, should not solely depend on government support, but should have independent resources and an independent existence. Private benefactions endowing scholarships, studentships, and research fellowships are urgently needed.

ASSOCIATION OF CLINICAL PATHOLOGISTS

As many as 250 members and guests attended some of the sessions of the annual meeting held at the Westminster Hospital on Jan. 25 and 26. Dr. ERIC WORDLEY, of Plymouth, was elected president and gave an address entitled Thoughts on the Future of Clinical Pathology. Sir Lionel Whitby and Dr. Magnus Haines were elected to the council.

At the scientific meetings, at which Dr. HAINES took the chair, the communications included a paper by Dr. N. F. MACLAGAN describing the thymol turbidity test as an indicator of hepatic dysfunction, with results mainly positive in cases of infective hepatitis and cirrhosis and negative in cases of obstructive jaundice. Dr. J. R. O'BRIEN showed slides of very early microscopic lesions of tuberculous endometritis; such lesions, he had found, were especially common in sterile women. Sir ALEXANDER FLEMING demonstrated methods of estimating penicillin in exudates and blood, and methods of assay. Dr. F. W. GUNZ reported 40 cases of intramedullary transfusion in infants, which he thought was the most suitable means of administering most parenteral fluids, particularly saline and plasma, but was unsuitable for blood. Dr. R. R. RACE, speaking on the incomplete Rh antibody, was greeted by several speakers who did not approve of the term "incomplete" antibody and others who objected to the use of "big A" and "little a" in the terminology of antibodies. Mr. N. G. HEATLEY, PH D, spoke to a colour film of laboratory methods used in penicillin work at the School of Pathology at Oxford, and in subsequent discussion Dr. E. S. DUTHIE proved that the action of penicillin was both bactericidal and bacteriolytic. He had also found that good results can be obtained in vitro with sulphonamide and penicillin in association.

The meeting ended with a lively discussion, opened by Dr. S. C. DYKE, on the dosage of liver extracts in the treatment of pernicious anæmia. A plea was put forward that the council of the association should make a further attempt to have all liver preparations standardised on a unit system.

At the annual dinner the guests included Vice-Admiral SHELDON DUDLEY, FRS, who spoke on pathology in the Navy and favoured part-time specialisation. He suggested that the bed-bug should be adopted as the badge of the association, since it was both clinical and pathological. Sir ALEXANDER FLEMING emphasised the importance of maintaining a clinical interest when doing hospital pathology, and Prof. S. A. SARKISOV conveyed greetings from Soviet pathologists. Finally, Major B. B. WELLS, biochemist to the Mayo Clinic, described the growth of clinical pathology in the USA, demonstrating how closely the problems besetting English pathologists are duplicated there.

NATIONAL SCHEME TO PREVENT BLINDNESS.—The National Institute for the Blind has opened a campaign this year to raise a large central fund to establish ophthalmic research centres in London, Oxford, Manchester, and Leeds for the prevention of blindness. It is intended to attach the centres to universities with hospital facilities. During the past year £100,000 has been raised, mostly from industry, as the result of the Oxford University ophthalmic appeal, and the research institute is in active operation and is to be extended. Many urgent research problems await solution, including the value of remedial exercises in defective vision, especially in children, the relation between eyesight and nutrition, and the effects of many industrial processes and of lighting. Following his work for the Oxford University Foundation, Sir James Marchant has been invited by the National Institute for the Blind to promote their campaign and communications should be sent to him at Lenthay Lodge, Sherborne, Dorset.

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In England Now

A Running Commentary by Peripatetic Correspondents

W. H. Hudson and other naturalists have written intimately of the relationships of birds and men, of characters common to both, of their interest in one another. Bird populations are much affected, adversely by man's destructiveness and favourably by his cultivation of the land, or, more purposefully, by his provision of sanctuaries. No-one who has planted an orchard and watched it grow can fail to have observed the encouragement given thereby to the finches, the warblers, and the tits. I can, however, recollect no essay on birds as a direct index of man's social progress (or backwardness) and of the stage of his sanitary achievement.

Travelling east to India by air and coming down to roost each day one is struck, from Cairo onwards, by the steadily rising "incidence" of that large and handsome hawk—the kite. Over Cairo he is plentiful enough, in Karachi more so, but in Old Delhi (and in many another Indian town or city) his numbers reach their peak. There are two existing Delhis—the Old and the New. The new, on its rising ground, is crowned with the magnificence of Viceroy's House, the Legislative Assembly, and the government buildings. Its radiating roads are broad and lined with leafy trees. Its fine residential bungalows have green gardens. All day in the sun-drenched sky some ten to twenty kites may be seen soaring at a great height. But a mile away is Old Delhi—picturesque, yes, but dirty, dusty, and smelly, with its teeming crowds and its noisome slums—a long way pre-Chadwick. And here the sky is literally thick with kites, not in tens or twenties, but uncountable in their hundreds or, may be, thousands. They fly much lower. They perch on the roofs and dusty roadside trees. They glide under the noses of the grey humped cattle to snatch a tasty morsel from the gutter. For they are man's scavengers. Their competitors are the small ubiquitous crow, and, guarding a slaughter-house or squabbling on the village refuse-dump, the ugly vultures.

Returning to England I looked up the kite in Yarrell's classic on British birds. He relates that a foreigner visiting England in the fifteenth century was struck by the kites in London, which seemed to excel even those in Cairo! Now, except for an occasional stray pair, the kite has been extinct for 50 years and more, and I do not know when London last saw one. Where man is poor and has not yet learnt or been given an opportunity to construct systems of drainage and refuse disposal in the modern way the kite soars and flourishes, regardless of climate. Infant mortality soars with him and the expectation of life at birth is less than half the expectation in the western world. Could a census be taken he would provide a rough numerical index of human poverty and squalor. When better times and modern conveniences come at last to India it may be safely predicted that the kite "incidence" will decline. Meanwhile he makes two contributions to æsthetics—first as a scavenger of man-made scraps and garbage, and secondly by the all-day vision he allows of his own handsome brown form and glittering eye as he flies by at arm's length from an upper window, or, raised above man's sorrows, wheels in a great company against the clear brilliance of an Indian sky.

* * *

It was an island somewhere in the Caribbean with a population of two hundred, and therefore too small to justify the appointment of a full-time mosquito inspector. Moreover, since it had no swamps and only a fresh-water spring it seemed unlikely that our local vector, with her strong preference for brackish water, would be found breeding there. The fact remained that blood-smears from two of its inhabitants admitted to our hospital on the principal island had shown a heavy *P. falciparum* infection. Evidently the three-mile stretch of sea between the two islands had not deterred some hardy female anopheline from making the crossing, for both the patients were youngsters who had never been off the island before. We were anxious to find out whether this was just a chance invasion by an infected mosquito travelling across almost at right angles to a strong prevailing wind, or whether there was a definite migration at certain seasons. We decided to enlist the services of the only official stationed there, the policeman. He was attached for a week to the nearest sanitary office and the sanitary inspector was told to give him practical instruction in the trapping and recognition of the common mosquitoes. Months passed and we had almost forgotten about him when the following arrived:

> SIR,—I have the honour to inform you that last night I arrested a mosquito of the genesis mephistoffeles. I attach corpse of same in matchbox.

* * *

One day I may write a thesis on *Psychological Reactions to Unpleasant Stimuli, with Especial Reference to the Behaviour of Naval Ratings Awaiting Inoculation.* But in case I never get beyond the "especial reference" the following notes may be of value to more serious students of behaviour. Possibly.

Naval ratings may be divided, according to their inoculation-reaction, into five types and one group. These are given in order of their appearance in response to the pipe: "Hands muster at the Sick Bay for inoculation."

(1) *Keen Type.*—These consider it an excellent thing and will even remind one when overdue. Very rare. Obviously abnormal, possibly masochistic.

(2) *Acquisitive Type.*—"Might as well have it. It's free and the Service doesn't give much away." Clearly obsessional.

The influence of these two types on the normal group is negligible. Anyway, they are harmless.

(3) *Non-specific Reactors.*—The normal group, who accept it as part of the matelot's burden and react according to their usual behaviour-pattern. Thus there are six sub-types:

- (*a*) Drippers. These, of course, drip.
- (*b*) Wags. These supply the heavy humour, and sing songs outside—e.g., "Why don't we do this more often" or "Roll me over, lay me down and do it again" or (to the tune of *Pistol Packing Mamma*) "Lay that needle down Doc, Lay that needle down. Needle-shoving ....., Lay that needle down."
- (*c*) Last-ship critics. "Not as good as the last doctor, he used sharp needles."
- (*d*) Favour-curriers. "Much better than the last doctor, he used blunt needles."
- (*e*) Suspicious types. "He only does it for what he gets out of it—half a crown a time."
- (*f*) Negative non-reactors.

All these are harmless, and jokes may be made without fear.

(4) *Patronising Type.*—These like to be personally sent for, and they arrive in a manner that plainly says: "I don't agree with it, but I don't mind being a guineapig."

This is slightly infectious and may impress younger types. It is best not to joke. More malignant are

(5) *Hostile Type.*—You can hear these coming: "I wouldn't have it, except that I'd get my leave jammed if I didn't." (Note: No man may be punished for refusing inoculation, but, to safeguard his messmates, he is not allowed ashore where there may be infection. The difference is subtle and not always appreciated by the objector.)

These are best treated coldly, without argument.

(6) *Conscientious Objectors.*—Very rare. Not infectious.

Oh, I forgot one: The Optimist: "Will this prevent me getting VD?"

* * *

In the obituary notices of our deceased colleagues we are never told the cause of death, whether the illness was long or short, borne with stoical gaiety or enfeebled depression, painful or easeful. This may be of little concern to many, but when one reads of the passing of a former acquaintance of student or house-surgeon days, and sees, perhaps, the latest studio portrait of a by-gone pal, one wonders if the lad of happy spirit or eager way met his final call with that easy abandon of thirty or forty years ago. Certainly, his degrees and successes count much; his learned societies; his aptitude for work; his home life and friendships. But what manner of death was his is of equal importance to those who knew and loved him. To some he is still John or Tom or Alick—the one-time friend of long ago who went other ways and got lost in the passing years. Life was good to him, so the obituary notice says; I can only pray death was good to him also.

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Parliament

THE NEW WATER BILL

THE object of the Water Bill introduced on Feb. 2 by the Minister of Health is to make it possible to meet "all reasonable needs for water by householders, industry, and agriculture" speedily and without avoidable waste. It imposes on the Minister, for the first time, the duty of promoting the provision of adequate water-supplies and conserving water resources.

The Bill embodies the proposals of the white-paper on a National Water Policy (see *Lancet* 1944, i, 572) which said that the problem "is not one of total resources but of organisation and distribution. . . . There is in this country ample water for all needs." As a preliminary, the Rural Water Supplies and Sewerage Act, 1944, making grants totalling over £15,000,000 available towards the cost of post-war extensions of piped water and sewers in rural areas, was passed last July.

Under the new Bill central responsibility for water policy is to be the function of the Minister of Health. The Central Advisory Water Committee is to be reconstituted as a statutory body and advise not only on matters referred to it but also, on its own initiative, on any question within its ambit. The general framework of existing local organisation is to be retained, but the default and directing powers of the Minister are to be strengthened, and amalgamation of undertakings and joint action are to be encouraged and if necessary enforced. The giving of bulk supplies by one undertaker to another is also to be enforced if need be.

Special steps are to be taken to protect water resources, especially underground water, against misuse, waste, and pollution. In places where special measures for conservation are required, a licence will be necessary before new wells can be made or existing ones enlarged, and water from underground sources must not be allowed to overflow and run to waste. Penalties are provided for pollution of water used for human consumption.

Industry and agriculture are to be given the right to demand water on reasonable terms and conditions, and the present law is to be altered so that the local authority must ensure that mains are, wherever practicable, brought to a point which will enable a house to be connected at a reasonable cost, and must insist that wherever practicable and reasonable, a *piped* supply is brought into the house. At present, the law is satisfied if a supply of wholesome water (e.g., a well) is within a reasonable distance of the house; and if so, even if a water-main runs past the house, there is no need for it to be connected.)

UNRRA'S SCOPE

A statement on UNRRA's powers and responsibilities has been made by Mr. RICHARD LAW, under-secretary for foreign affairs. Under the UNRRA agreement and the resolutions of the UNRRA Council, he said, it can operate only fully and freely after the termination of the military period, and it can operate only in liberated territories at the request of the governments concerned. UNRRA has, however, at the request of the military authorities, and acting as their agents, already sent a relief mission to Greece. This mission has been collaborating with the military relief organisation for some time past and plans are being made for its expansion. It is hoped, moreover, that UNRRA will shortly be enabled to start operations on its own account and on an increasing scale in other Balkan countries. The Greeks, Yugoslavs, Poles, and Czechoslovaks have all expressed a wish to receive UNRRA's help, particularly in the matter of supplies, and plans are being made for the despatch of supplies as soon as shipping and other similar difficulties have been overcome. UNRRA also has in hand a limited programme for relief work in Italy, as provided for by resolution No. 58 of the council at Montreal, and a mission is already in that country making preliminary arrangements. The governments of France, Belgium, Luxembourg, the Netherlands, and Norway have expressed their wish to receive liaison missions, and such missions are already established in Paris and Brussels. These and other governments have also asked UNRRA to undertake, under the control and direction of the military authorities, the work of caring for and repatriating their displaced nationals in Germany. UNRRA's arrangements for dealing with this problem, as agents of the Anglo-American military authorities, are well advanced, and the training of the necessary personnel has been proceeding for some time.

On the other hand, it is not anticipated that the West European governments will find it necessary to invoke the aid of UNRRA for the actual provision of supplies, which they expect in most cases to be able to procure and pay for themselves.

In this connexion Mr. Law pointed out that UNRRA is not responsible for the importation of supplies into France, Belgium, and Luxembourg. This responsibility lies with the military authorities, and large quantities of relief supplies have in fact been imported by the combined UK-US military authorities during the liberation of these countries.

HM Government are fully alive to the urgent need of bringing relief supplies to the liberated areas and the social and political consequences of failure to satisfy those needs. But I do not think, he added, that the solution of the problems would be facilitated by any attempt at this stage to revise the UNRRA agreement and the council resolutions which constitute UNRRA's terms of reference.

DEPARTMENTAL COMMITTEE ON ARTIFICIAL LIMBS

The MINISTER OF PENSIONS has received from the Departmental Committee on Artificial Limbs the following unanimous recommendations:

(I) The formation at an early date of an experimental department, which in the committee's view would be most suitably located at Roehampton; this department to be under the direction of a wholetime officer of suitable status possessing both medical and technical qualifications.

(II) The appointment of a small standing committee to supervise and develop research and advise on improvements in artificial limbs; this advisory committee, membership of which should not be limited to Ministry of Pensions personnel, to work closely with the proposed experimental department.

The committee further submit that if these recommendations are accepted, a public announcement should be made; they attach importance to giving encouragement to members of the public to send in ideas and suggestions, and consider that it should be one of the functions of the research committee to receive and study such suggestions.

The Minister has accepted these recommendations and has selected for the research post Dr. A. W. J. Craft, who will shortly take up his new duties.

QUESTION TIME

Children's Homes Inquiry

Sir WALDRON SMITHERS asked the Home Secretary whether, in view of the recent disclosures, he would call for a report on conditions prevailing in children's homes under the administration of local authorities; and would he arrange that those who made the inquiries were not members of local authorities and that they would include at least one member of the medical profession.—Mr. H. MORRISON replied: The homes referred to will come within the scope of the committee which is being set up jointly by the Minister of Health, the Minister of Education, and myself. I cannot accept the implication that no member of any local authority can be relied on to form a sound judgment on this matter.—Sir W. SMITHERS: Is the Minister aware that the public conscience is seriously perturbed about recent revelations and the inefficiency of municipally and State-controlled homes?—Mr. MORRISON: My hon. friend should not introduce prejudices of that kind. There are plenty of other homes that will have to be investigated.

Mr. G. NICHOLSON: Is the Minister aware that there is growing public anxiety about the whole treatment of orphan children, not only in State and municipal homes, but all round, and will he do his best to allay this anxiety by holding a proper public inquiry?—Mr. MORRISON: That is why the committee is being appointed.—Earl WINTERTON: Will the Minister make it clear that voluntary authorities will also be investigated; and is he aware that many of us, without any political feeling in the matter, are seriously concerned about

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the treatment of children in both types of homes?—Mr. MORRISON: The inquiry will cover all types of homes.

London Remand Homes Report

Mr. K. M. LINDSAY asked the Home Secretary when he expects to receive the report of the inquiry into the administration of remand homes in London.—Mr. MORRISON replied: I have now received the report and have arranged for it to be published as a command paper as soon as possible.

Discharged while in Hospital

Mr. G. S. SUMMERS asked the Secretary of State for War what was the practice regarding the discharge from the Army of men in hospital unlikely to be fit for further service; and whether those so placed would be retained in the Service at least until release from hospital was authorised.—Sir JAMES GRIGG replied: Men discharged in hospital as "ceasing to fulfil Army physical requirements" are entitled to 56 days' notice, during which period they receive full pay and allowances. At the end of this time their discharge from Army service is confirmed, but they are retained in hospital as non-paying patients. They continue to receive medical treatment, but may be removed to a Ministry of Pensions hospital or, in special types of disability, to institutions under control of local authorities. But this whole question is being examined in conjunction with the other Services.

Army Order No. 9

Dr. E. SUMMERSKILL asked the Minister if he was aware that the operation of this order was causing great distress to soldiers invalided from overseas on account of psychosis; and if he would take action to prevent the continuance of this hardship.—Sir JAMES GRIGG replied: The practice in these cases has been reviewed and a new Army order to take the place of this one will be issued as soon as possible.

NHI Dispensing

Mr. C. A. S. MANNING asked the Minister whether he had considered the action of a firm of chemists who were under agreement with many insurance committees in refusing to supply preparations ordered by insurance practitioners, on the pretext that such preparations were manufactured by firms of alleged enemy origin, and in substituting their own products; and what action he proposed to take with regard to cases of this nature which had been brought to his notice.—Mr. WILLINK replied: I am aware of the circumstances, but I have no jurisdiction in the matter except where breaches of the chemists' terms of service under the National Health Insurance Acts are alleged or established. One appeal now stands referred to me but I am not yet in a position to give my decision.

Nutrition and Health of Coalminers

Colonel L. ROPNER asked the Lord President of the Council whether arrangements could be made for the Industrial Health Research Board to carry out an exhaustive survey of the nutrition and health of British coalminers in the light of recent scientific discoveries in those fields.—Mr. C. ATTLEE replied: Clinical and scientific inquiries into the health and nutritional state of miners have been and will continue to be made. I am taking up with the various interested departments the question whether a more general survey would be helpful, and if so by what agency it could best be conducted.

PUBLIC ASSISTANCE (AMENDMENT) ORDER, 1945.—Mr. H. WILLINK explained that the purpose of this order is to revoke article 92 of the Public Assistance Order, 1930, which limits the discretion of local authorities as to the categories of children who may be boarded out.

THE Institute of Aeronautical Sciences of the United States have presented their John Jeffries award for 1944 to Air Marshal Sir Harold Whittingham, director-general of the RAF medical services.

SURGICAL RUBBER GLOVES.—Any doctor in private practice requiring surgical rubber gloves for professional use should apply to the secretary of the Central Medical War Committee, BMA House, Tavistock Square, London, WC1, marking the envelope "Gloves" in the top left-hand corner, and enclosing a stamped addressed envelope for reply. He will then receive a booklet of 6 certificates allowing him to purchase a maximum of 6 pairs during 1945.

Letters to the Editor

HOSPITAL FOOD

SIR,—*Amazing* is the only comment I can make on Administrator's exaggerated attack on house-officers (Jan. 27, p. 130), who, she says, expect and demand a higher standard of catering than the average patient in hospital. No newly qualified house-officer expects the standards of a first-class pre-war hotel, but much could be done to improve institutional food.

As a recently qualified man who worked 18 hours a day at the ridiculous rate of £100 per annum, and put up with the disgusting institutional food which some administrator deemed fit to serve, I would like to lodge the strongest possible protest against the bad living conditions for young house-officers. The outcome in many cases is disastrous, and the incidence of pulmonary tuberculosis in newly qualified men is an alarming feature of medical practice.

The average patient who comes into hospital for a short spell puts up with bad food; it is hardly worth his while to complain about it, for as soon as he is discharged he returns to his household for home cooking. Medical and nursing staffs, on the other hand, live at the hospital and find bad institutional food no compensation for long hours and overwork.

It is high time the welfare of medical officers received some consideration, and no amount of argument can release administrators from their responsibility towards ameliorating the living conditions and feeding arrangements for them.

HOUSE-OFFICER OF SOME EXPERIENCE.

ROYAL MEDICAL BENEVOLENT FUND

SIR,—It was with the utmost gratification that the late Sir Thomas Barlow received the news that his last Christmas Gifts appeal, made when he was in his 100th year, had once again eclipsed all previous records and had reached the splendid total of £1817.

Had his life been spared Sir Thomas would be personally sending this letter of his most grateful thanks to the medical press and thereby to the large number of subscribers up and down the country who, by their generosity, have contrived that each year the sum reached has beaten the previous year's record. In particular, the gracious donation of one hundred guineas by the Royal College of Physicians to commemorate his entry into his 100th year and to mark the esteem in which his colleagues held him, touched Sir Thomas very much and gave him keen pleasure.

On behalf of my committee I tender to one and all our sincerest thanks. We shall continue this annual Christmas Gifts appeal as heretofore. They have been so generously supported and have evoked so much pleasure and gratitude that, although they will lack the inspiration of Sir Thomas Barlow's personality, we feel they have now become an integral part of our work. We are confident that this will be in accordance with the general wish.

ARNOLD LAWSON,
Chairman of the Committee of Management.

Royal Medical Benevolent Fund,
1, Balliol House, Manor Fields,
London, SW15

A FACULTY OF OPHTHALMOLOGISTS

SIR,—The statement by the Council of British Ophthalmologists (CBO) summarised in your last issue does not mention that for the past year the Council has been discussing the proposed Faculty with the Association of British Ophthalmologists (ABO)—an actively functioning, democratically constituted, body which includes nearly half the full-time practising ophthalmologists in the country and is also open to part-time ophthalmic practitioners of experience. I write this letter as a private individual, but I was president of the ABO when the negotiations started, and know why they broke down.

The CBO, composed of some 15–20 senior consultants, mainly in the London area, has had a purely nominal existence unknown to the mass of ophthalmologists, and has been almost moribund for the past decade at least. The average age of its members must be between 60 and 65, all in an assured position, and they held aloof from

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any interest in ophthalmo-political matters until the ABO passed a motion at its annual general meeting in 1943 to initiate a movement to found a College or Faculty or similar Institute of Ophthalmology.

It would seem that the CBO was then suddenly stimulated into active interest. The council of the ABO welcomed this interest in the hope that its origin was disinterested, but it transpires that the CBO's intention was, and is, to take control of the movement and direct its future course. The constitution proposed by the CBO included a non-elected senior directorate or "upper house." It was also suggested that the constitution was not to be subject to alteration by any future majority vote of the constituent members. The ABO gave way on various matters, but insisted that the constitution of the proposed Faculty must be entirely democratic; that election to the Faculty council must be by vote; that a majority postal vote of members must be binding on all matters; and that the proposed constitution must be subject to alteration annually in the same democratic fashion. It refused to give way on this point: hence the final failure of negotiations.

Under the constitution now proposed by the CBO only a small proportion of ophthalmologists will be eligible for election as members of the Faculty: generally speaking, they must have charge of beds in hospitals approved by the CBO, and "provisionally, these will be general hospitals of more than 200 beds and special ophthalmic hospitals of more than 20 beds." Other ophthalmic surgeons of consultant rank "approved by the CBO" will also be eligible. Of the 21 members of the future Council of British Ophthalmologists, which will be executive of the new Faculty, 15 will be elected by this small and select constituency.

The Faculty has been registered by the CBO already, and this step was taken during an interval between negotiations without the knowledge or approval of the ABO, at a time when the ABO had been requested not to take any official steps which might in any way upset the mutually desired successful conclusion of the negotiation.

London, W1. LIONEL M. GREEN.

PNEUMOCOCCAL LOBAR PNEUMONIA

SIR,—The paper by Ramsay et al. in your issue of Jan. 20 confirms the efficacy of sulphamezathine in the treatment of pneumococcal lobar pneumonia. The results, however, hardly justify it as the drug of choice. In 1941–42 I treated in Glasgow 441 cases of typed pneumococcus lobar pneumonia with sulphapyridine. There were 38 deaths; excluding 8 patients who died within 24 hours of admission to hospital the fatality-rate was 7·0%. Although the newer chemotherapeutic agents such as sulphadiazine and sulphamezathine are admittedly less toxic, they are no more effective than sulphapyridine. Sulphadiazine is probably the one of choice; I have seen severe leucopenia develop soon after administration of sulphamezathine.

In spite of chemotherapy, failures in the treatment of pneumococcal lobar pneumonia are inevitable. The results of chemotherapy combined with serum or vaccine therapy are no better than those of chemotherapy alone.[1] I wondered whether the results could be improved by giving a more intensive course of chemotherapy; but the observations I recorded in your last issue show that the clinical response cannot be correlated with the concentration of the drug in the blood. Hence I do not believe that the fatality-rate could be lowered by giving larger doses.

In their analysis of fatal cases Ramsay et al. mention 5 patients who died and who had low blood-levels of sulphamezathine. Unfortunately only one case is analysed in detail—that of a man aged 57, with a type V infection, admitted on the 10th day of illness. They later refer to 9 patients—all with adequate, and 3 with high blood-levels—in whom death was attributed to toxæmia; 3 of these were treated before the 7th day of illness. It is obvious that deaths can occur in the presence of a high blood-level; are Ramsay et al. justified in assuming that the deaths of the first 5 patients were due to the low blood-level of sulphamezathine?

It is clearly established that in the aged the sulphonamides are not nearly so effective as earlier in life; in the aged pneumonia is likely to be a severe disease. Moreover many patients are admitted to hospital when the disease is already well established. If we are to reduce the fatality-rate the diagnosis must be made earlier in the illness. More reliance might be placed on the history and early physical signs, and treatment should begin before the classical signs of dullness on percussion and tubular breathing are well established.

Royal Northern Infirmary, Inverness. ARCHIBALD DICK.

1. Dick, A. *Lancet*, 1944, i, 564; Plummer, N., Liebmann, J., Solomon, S. Kammerer, W. H., Kulkstein, M., Ensworth, H. K. *J. Amer. med. Ass.* 1941, **116**, 2366.

EXUDATIVE TONSILLITIS

SIR,—Judging by his letter of Dec. 30, Dr. Alcock cannot have read Neubauer's paper (*Lancet*, 1943, ii, 192). In my experience diphtheria in an immunised person is a very definite entity. The condition simulates tonsillitis closely, but may include any of the classical signs—fœtor, adenitis, œdema, myocarditis, and neuritis—and a new one, circumoral pallor. Naturally after immunisation these are not as obvious as in ordinary diphtheria. In the immunised patient the membrane is very like that seen in tonsillitis; it is easily stripped without bleeding, but recurs and is resistant to sulphonamides. To say that membrane alone is the essential and diagnostic lesion is a very big statement.

Machynlleth, Montgomeryshire. RONNIE CLARKE.

Rh ANTIBODY IN BREAST MILK

SIR,—In your leader of Nov. 4, 1944, A Year's Work on the Rh Factor, the statement is made that breast-feeding is contra-indicated in babies affected with hæmolytic disease of the newborn because of the risk of continued hæmolysis of the baby's red cells from Rh antibodies ingested with the breast milk; you recommend that the breast milk should be drawn off and boiled before use. To deny the baby the breast without good reason is such a major catastrophe that one is tempted to ask what evidence there is that Rh antibodies from the mother's milk can reach the baby's blood-stream in sufficient titre to damage the red cells. And, in view of your statement, I describe below the findings in a case which I have recently investigated which indicate that the hæmolytic process continues quite apart from breast-feeding.

Clinical jaundice developed in a baby (blood-group A, Rh-positive) on the third day after birth. Investigation revealed that its mother was group A, Rh-negative, and that an Rh antibody, active to a titre of 4–8 against the baby's cells, was demonstrable in the mother's serum. The jaundice rapidly cleared, but the baby became increasingly anæmic, and when 12 days old its hæmoglobin was 58% (Haldane). Despite the transfusion of 100 c.cm. of Rh-negative blood compatible with the mother's serum, the hæmolytic progress continued, and after a further 11 days the baby's hæmoglobin had dropped to 50% and its red cells totalled 2,400,000 per c.mm. A differential-agglutination count showed that approximately 1,300,000 of these cells were transfused cells, so that had no transfusion been given the baby's hæmoglobin level would have been in the region of 22%. After a further transfusion of Rh-negative blood, the baby made an uneventful recovery.

This case was thus a typical example of the progressive type of anæmia associated with hæmolytic disease of the newborn, but the most significant finding was that the baby had not been put to the breast after the second day as the mother had developed a serosanguinous discharge from both nipples. During the time when the hæmolytic process was proceeding steadily it was being fed on a boiled cow's-milk mixture. Hence, there was no possibility in this instance that the ingestion of Rh antibodies was responsible for the continuance of the hæmolytic process.

Army Blood Transfusion Service. GEOFFREY H. TOVEY.

*** Rh antibodies were first demonstrated in breast-milk by E. Witebsky, G. W. Anderson, and A. Heide (*Proc. Soc. exp. Biol., NY*, 1942, **49**, 179. 1943, **52**, 280). The titre is usually low, and there is no direct evidence that breast-feeding in these cases causes continued hæmolysis of the baby's cells, but E. Nickerson and R. T. Moulton (*New Engl. J. Med.* 1943, **229**, 863) noticed that even apparently unaffected infants nursed by sensitised mothers did not do so well as expected.—ED. L.

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RADIO-FREQUENCY CURRENTS IN TUMOUR TREATMENT

SIR,—During our work on radio valves, one process called "ECH" or "eddy current heating" gave us an idea which might be applied to medicine. This process consists of passing radio-frequency currents through coils which are around (but do not touch) the valve being treated. As a result the metal parts of the valve glow red hot because of the currents induced in them. When this occurs, any gases present in the metals are released and mostly drawn off by vacuum pumps; a little gas may however remain and therefore a second operation known as "gettering" is performed. A small metal pellet containing barium is placed inside the valve. When radio-frequency currents are now passed through the coils surrounding the valve the pellet is caused to heat up and the barium splutters around the inside of the glass, forming a mirror which absorbs any further gases.

We wondered whether a pellet in the form of a pastille containing a small quantity of metal could be given to a patient and its progress watched by X rays until it reached the seat of the trouble, when point electrodes or coils could be brought near and the patient "gettered." This might enable deep-seated cancers or such-like to be destroyed when a knife could not reach them, and save the patient the fear of an operation or anæsthesia.

G. ANDREW FORSYTHE.
Baldock, Herts. H. MCCORMICK.

STOMATOLOGY OR DENTISTRY?

SIR,—Mr. Bowdler Henry says that "morally it is not right that he who condemns a patient to lose teeth should profit by the fitting of artificial substitutes. Ethically it does not enhance professional status that a dental surgeon should be a party to the sale of goods over the counter." In view of this extreme statement will Mr. Bowdler Henry as a stomatologist and a man of sincerity assure us that "the fitting of artificial substitutes" has been entirely given up in his private practice?

Queen Anne Street, W1. W. PEEBLES.

On Active Service

CASUALTIES

KILLED

Lieut.-Colonel MARTIN PATRICK CONROY, MB NUI, IMS
Captain JOHN RAVENHILL SWEETING, MRCS, RAMC

WOUNDED

Captain S. D. STOCK, OBE, MB LOND., RAMC

AWARDS

GC

The late Captain JENKIN ROBERT OSWALD THOMPSON, MRCS

This award is for conspicuous gallantry and devotion to duty on board hospital ships since the start of the war, notably on the *Paris* at Dunkirk in May, 1940, and on the *St. David* at Sicily, Salerno, and Anzio, when in each instance, in spite of repeated dive-bombing attacks and enemy shell-fire, Captain Thompson showed indifference to danger and physical exhaustion in the care of his patients. At Anzio on the night of Jan. 24, 1944, when the *St. David* was sinking rapidly as the result of a direct bomb-hit, he organised parties to carry the seriously wounded to safety in the boats and was thus instrumental in saving many lives. When the ship was obviously about to founder and all were ordered to save themselves, he returned alone in a last effort to save the one remaining helpless patient still lying trapped below. It is presumed that Captain Thompson went down with the ship.

CBE

Brigadier H. L. G. HUGHES, DSO, MC, MRCS, RAMC (R of O)
Brigadier A. E. PORRITT, OBE, M CH OXFD, RAMC,
Brigadier Q. V. B. WALLACE, OBE, MC, MB DUBL., RAMC

DSO

Colonel H. M. ELDER, RCAMC

OBE

Colonel R. D. CAMERON, MC, MB EDIN., RAMC
Lieut.-Colonel ERIC CATFORD, MRCS, RAMC
Colonel W. M. EVANS, MC, MB LOND., RAMC
Colonel C. D. GOSSAGE, RAMC
Colonel CYRIL HELM, DSO, MC, MRCS, RAMC (R of O)
Lieut.-Colonel L. R. H. KEATINGE, MB DUBL., RAMC
Lieut.-Colonel S. C. H. LANE, MB LOND., RAMC
Lieut-Colonel J. P. LAPLANTE, RCAMC
Colonel C. B. LEECH, RCAMC
Lieut.-Colonel ALASTAIR MACLENNAN, MB ABERD., RAMC
Lieut.-Colonel P. R. MITCHELL, MB ABERD., RAMC
Lieut.-Colonel J. A. NOBLE, RCAMC
Lieut.-Colonel I. A. M. PATON, MB EDIN., RAMC
Colonel C. S. THOMPSON, RCAMC
Colonel K. A. M. TOMORY, MB EDIN., RAMC

BAR TO MC

Captain F. W. HAYTER, RCAMC

MC

Captain H. L. HANDFORD, RCAMC
Captain P. W. HENDERSON, BM OXFD, RAMC
Captain W. S. HUCKVALE, RCAMC
Captain J. JOHNSTON, RAMC
Captain J. M. MURPHY, RAMC

MEMOIRS

Captain PAUL ADLER, who was killed in action in Burma last November, was the son of Mr. James Adler of Hamilton Terrace, London, NW8. He was educated at Bradfield College and Christ's College, Cambridge, and joined the Army immediately after he qualified at the London Hospital in the autumn of 1939. During 1940 he worked on an ambulance train in France, and he later served with various units in England before he was sent abroad, at first to East Africa and later to Burma. He was 29 years of age and leaves a widow. J. R. B. writes: "I knew Paul Adler well at the London, where we often worked together in the library and museum, and I spent many weekends with him on his boat, at his home, and in the country. He was a grand companion at all times, who put all his energies and interest into whatever he was doing, and this made him a fine soldier when war came. His letters, written as an RMO, showed his absorption in the details of his men's lives, and of the places he visited."

Captain MICHAEL MULLINS, SAMC, who died on Dec. 26 of pneumonia while on active service in Italy, came to this country two years before the outbreak of war to study at Trinity College, Oxford. In 1939 he began his clinical work at Guy's where, like his father and his uncle, he captained the rugby team. The year of his captaincy, 1941–42, was one of Guy's most successful seasons and much of it was due to his leadership on the field. Playing as a wing-forward he was fast on the ball, running like a three-quarter with a most disconcerting side-step, and a master at "selling the dummy." But he was a good scholar as well as a fine athlete and his work was always his first consideration. His record at hospital was one of diligent conscientiousness, and sympathetic interest in the welfare of his patients. "But above all," writes S.M.C., "Mike will be remembered for his human-heartedness, his affection for his fellow men, and his infectious jovial outlook on life." After he qualified in 1942 he held house-appointments in the Guy's sector hospital at Pembury, but he hankered to return to South Africa to serve with his own countrymen, and early in 1943 he sailed for home with his newly married wife, a Guy's staff nurse, whom he leaves with a small daughter. He was 28 years of age.

US MEDICAL HISTORY OF THE WAR.—Colonel Albert G. Love, historian of the US Army Medical Department, states that plans have been made to complete the medical history of the war six months after victory in the Pacific. Administrative aspects of the medical service—including supply, personnel, training, and hospital construction—will be recorded by a number of officers commissioned in the Medical Administrative Corps, most of whom are university graduates in history and half of whom are now serving overseas. The medical aspects will be dealt with by medical officers especially qualified in various specialties. Twenty-three years were required to complete the medical history of the American Civil War, and ten years to complete that of World War I. Early publication of the current history is thought desirable because many of the advances in military medicine will be applicable in planning for national defence and in civilian practice.

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Obituary

THOMAS HARRISON BUTLER

DM OXFD, FRCS

Harrison Butler was born in 1871, the son of a clergyman. He was educated at St. Paul's, Dorchester grammar school, and Oxford, where he secured first-class honours in natural sciences. He qualified from St. Bartholomew's Hospital in 1895, and after he had held one or two house-appointments the Radcliffe travelling fellowship gave him the opportunity of several years' study abroad. He worked at Kiel, Berlin, Dresden, Vienna, and Paris, and for a time was plague medical officer at Durban and harbour doctor at Port Elizabeth. A thesis on plague gave him his doctorate at Oxford in 1902, and in the four years following he was assistant surgeon to the St. John Ophthalmic Hospital at Jerusalem where he gained a wide experience of eyes. Returning to this country he settled in ophthalmological practice in Coventry and Leamington and became ophthalmic surgeon to the Coventry and Warwickshire Hospital; in 1913 he was elected to the staff of the Birmingham and Midland Eye Hospital. His connexion with these two cities lasted over 40 years, during which his reputation grew, not only in the Midlands, but throughout the country. When he had finally attained the leisure to which a long life of hard work had entitled him, he returned to hospital work in Birmingham for more than five years of this war, to assist a depleted staff by replacing his younger son who was called to the Forces.

"He will remain in the memory of English ophthalmologists," writes P. J. E. "as a human personality; and those of us who worked with him have a sense of lost affection. He was universally welcomed for his forthright honesty and his desire to encourage the younger generation, with whom he spared no pains. He was intensely happy in his work and derived from it a humane satisfaction, for he enjoyed the society of his fellow men. His services to the unity of Midland ophthalmology cannot be easily estimated, but in attaining the position of acknowledged leader he symbolised the best and held a paternal sway."

His activities in the social side of ophthalmology absorbed much time and energy; but the energy was always abundant. He came to occupy the high places and did so naturally and with good humour. He was at various times president of the Ophthalmological Society of the United Kingdom, of the ophthalmic section of the Royal Society of Medicine, of the ophthalmic section of the British Medical Association, of the Birmingham branch of the BMA, and of the Midland Ophthalmological Society. An enthusiastic member of the Oxford Ophthalmological Congress, he was an active member of council for many years and was always ready with help, advice, and hospitality: in 1924 he received the Doyne memorial medal. He was also a foundation member of the Midland Ophthalmological Society, its president from 1919 to 1921, and its untiring secretary for 28 years. The final and appropriate honour bestowed upon him was his election in 1941 to the honorary fellowship of the Royal College of Surgeons, which set the seal on his pre-eminence and worthily marked the appreciation of his work.

His writings were numerous though mostly short. He was the first to write an English book on the slit-lamp, and his opinion on the use of this instrument was eagerly sought. He always provided his own illustrations for his articles, for he was an able artist. While he was affectionately known by all connected with ophthalmology in this country, he was even more widely known in his capacity as a yacht designer. Some idea of his vitality is given by the fact that he contrived, in his little spare time, to achieve an international reputation in the design of small cruising yachts: in this sphere too, and as a leading member of the Corinthian Yacht Club, he became an acknowledged authority, and from this hobby he derived the same simple pleasure which a generous nature afforded him in his professional work.

"His work was characterised by the utmost care and skill," writes C. R. "Every new method was considered and tried by him—new instruments were examined and tested, and if he considered them of value were brought into daily use. His early work on the slit-lamp is an example of this. He was always ready to instruct, help, and encourage his house-surgeons and juniors, and many ophthalmic surgeons, both in this country and abroad, owe him a debt of gratitude. He had a great love for mankind and this showed itself in his treatment of his patients: he was always available to them in their troubles and they held him in the highest esteem. He spoke his mind fearlessly but was never unkind. He held firmly to his opinions but, if proved wrong, was the first to admit a mistake and to give credit where it was due. To the end of his career he retained a youthful energy and enthusiasm which is rarely seen."

Mr. Harrison Butler died on Jan. 29. His wife, the daughter of Dr. W. H. Reed, survives him with two sons, both of whom are doctors serving with the Forces. His younger son has succeeded him as house-surgeon to the Birmingham and Midland Eye Hospital, where the family tradition thus continues.

HERBERT SMALLEY

KT, M D DURH.

ON Jan. 25 Sir Herbert Smalley died at Hove, aged 94. He worked in the prison medical service from 1876 to 1914, and was HM Commissioner of Prisons for three further years.

His father was the Rev. Cornwall Smalley and he was born in London. He went to St. Paul's School and thence to King's College, London, of which he later became an associate. Qualifying as MRCS in 1875, he was appointed assistant surgeon to Chatham prison in the following year, and served successively in the prisons at Millbank, Dartmoor, Pentonville, Dover, and Parkhurst. In 1890 he was promoted to be a medical inspector of prisons, a post for which he was well fitted by his practical experience. As an inspector he did his best to raise the status of prison medical officers, and to put the medical care of prisoners on a scientific foundation. Especially he was concerned with the conditions in prison hospitals, and in 1902 he produced a useful book on *Prison Hospital Nursing*. He gave evidence before the Royal Commission on the Care and Control of the Feebleminded (1904), and his contributions to the annual reports of the Prison Commissioners showed a consistent endeavour to reconcile the efficient conduct of prisons with humanity towards their inmates. The knighthood bestowed on him in 1913 showed that his conscientious labours were appreciated officially; but he was also respected and liked by his associates in the service, and particularly by the prison medical officers. "We admired," writes one of them, "his ripe experience, sincerity, integrity, and friendliness, and his unshakable firmness of purpose. He realised that where medical and administration points of view came into opposition a degree of compromise was advisable, so long as principles were not involved. But he was a strong man at the Board of Commissioners, able to take into consideration other points of view besides his own."

He married in 1885 a daughter of G. F. Gramman, but they had no children.

HAROLD COLLINSON

CB, CMG, DSO, M S LOND., F R C S

WE recorded last week the death on Jan. 25 of Mr. Collinson, the well-known Leeds surgeon. He was 68 years of age and had been ill for some time.

The son of a wool merchant, Harold Collinson was born in Halifax and educated at Ackworth and Bootham schools, whence he became a student at the Leeds Medical School of the Yorkshire College (then part of the Victoria University), and ultimately at the General Infirmary. He had a brilliant academic and clinical career in what were perhaps the greatest days of Leeds surgery. Going through the usual appointments that precede election to the staff, he became assistant surgeon in 1907 and surgeon some 11 years later. In the University of Leeds he was clinical lecturer, professor of clinical surgery (1927–33), professor of surgery (1933–36) and dean of the medical faculty (1936–41).

From 1905 onwards he trained himself for war service, and in 1914 he was mobilised with his unit, the 2nd West Riding Field Ambulance. Going to France in the following year he became ADMS in the 62nd (West

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Riding) Division, and was later promoted to colonel. He put all his energy into his war service and was appointed DSO in 1916, CMG in 1918, CB in 1919, and a chevalier of the Legion of Honour.

During the present war he was group officer and regional adviser in surgery under the Emergency Medical Service in region 2. Until 1941 he was also dean of the Leeds medical school, and throughout his career he was closely associated with the students—first as a teacher and later as an adviser. In both capacities he won their affection and respect, and he was a great favourite with them.

"Collinson's surgical technique was first-class, and his judgment sound," writes a colleague. "He never refused to perform any operation when he had made up his mind it was justified, though his approach to novelties was somewhat sceptical. He had great energy and drive; he was always willing to help others and give generously from his experience; he criticised freely but fairly, and was not afraid to give high credit to others when he thought it due; and in all his contacts with other men he was absolutely honest. In his recreations he was as enthusiastic as in his work; he was at one time a vigorous hockey player, and almost reckless in the hunting field; he was a lusty trier at golf and later an ardent angler. He was a man trusted by everyone—genial, kindly, and manly."

Mr. Collinson leaves a widow, a son who is a member of the medical profession, and two daughters.

DAVID LIVINGSTON HAMILTON

FRCSE

Dr. Hamilton died at Cambridge on Jan. 27, within a few days of his 81st birthday. He was born at Armagh and was educated at Ledwick School and Carmichael College, Dublin, and at Owens College, Manchester. He took the Scottish triple qualification in 1887 and the licence of the Coombe Hospital in the following year, and in 1895 he obtained the fellowship of the Edinburgh College of Surgeons. He became hon. anæsthetist to the Southern Hospital, Manchester, in 1902. For many years he was in practice at Great Missenden, Bucks, and later at Dover, where he remained till the evacuation of 1941, when he bought the practice in Cambridge where he worked till within a few days of his death. He took care to keep up with the advance of medical methods, and everywhere his kindness quickly won the confidence of his patients.

A keen Volunteer and Territorial, during the last war he commanded the 82nd field ambulance in France, with the rank of lieut.-colonel, and was later appointed DADMS to the 1st Army in England. Another of his interests was the St. John Ambulance Brigade and in 1934 he was appointed a serving brother.

Dr. Hamilton's first wife, Miss Helen Bagge, died in 1903, and in 1922 he married Miss Gertrude Marshall who survives him. He had three sons, now all serving in the Forces, and two daughters.

ARTHUR THOMAS WILKINSON

MD LOND., BSC VICT., FRCP

By the death of Dr. A. T. Wilkinson on Jan. 21, Manchester loses the last of its three distinguished nonagenarian physicians. The other two were Graham Steell and Judson Bury.

He qualified in 1876, having previously collected London degrees in arts and science, from Owens College, and numerous honours by the way. Before joining the honorary staff of the Manchester Royal Infirmary he was house-physician there, and for nine years assistant medical officer. He was especially interested in renal diseases, on which he wrote usefully in this journal and elsewhere, and as president of the Clinical and Pathological Societies he took a full part in the professional life of Manchester. But his main contribution was educational. From his earliest medical days he was a teacher; for, when himself up for examinations in London, he would collect round him fellow students with the same object, and by question and answer he would give them final and good advice. A correspondent of the *Manchester Guardian* points out that there was one student whom he never pushed through; but Francis Thompson was an unwilling learner.

Wilkinson's teaching was practical both in diagnosis and treatment; he had a retentive memory, and with experience of general practice and hospital work he was able to give many useful hints, especially in the use of drugs. At the Royal Infirmary he acted for many years as dean, giving sound advice to the students who came his way. Both during his medical career and when he had retired from practice he spent much of his time in evangelical work, for he was a keen and able Methodist preacher and worker; and throughout his life he was always willing to give free medical aid to those engaged in social and religious endeavour. His chief hobby was colouring lantern slides. This he did very cleverly, adding much interest to lectures which he and others gave on travel. To the end he retained all his faculties; and his letters, both in their characteristically clear writing and in their composition, were a delight to his friends. He came of a long-lived family, for quite recently there were six of his generation alive, with an average of over 80 years. His son is Dr. A. G. Wilkinson of Egham.

EDWIN ARTHUR PETERS

MD CAMB., FRCS

It is now more than ten years since Mr. E. A. Peters left the active staff of University College Hospital, the Bolingbroke Hospital, and Paddington Green Children's Hospital, where he was surgeon to the ear, nose, and throat departments. He died at his home at Netley Abbey in Hampshire on Jan. 29 at the age of 76.

He was the son of Edwin Peters, and was educated at Charterhouse, and at Caius College, Cambridge. Taking a first-class in the natural sciences tripos, he went to Guy's, where he was awarded the gold medal for diagnosis. He qualified in 1894, and after postgraduate study at Heidelberg, and house-appointments at Guy's and elsewhere, he was elected to the staff of the Royal Ear Hospital. There he quickly won a reputation as a sound aurist not given to rash judgments. A careful operator, he was keenly interested in his craft and did much to modify and perfect the technique of aural operations, particularly those on the mastoid. When the Royal Ear Hospital was moved to University College Hospital his happy outlook on life and sound common sense were valuable assets to the new department. "Peters and the other members of our combined staff," writes G. S. H., "worked hard together in planning and equipping the new department. While sticking to his point in our many discussions, he always poured oil on troubled waters when arguments became heated, and he was beloved of us all." Exceptionally well read, and a brilliant conversationalist, it was difficult to find a subject with which he was not acquainted.

When Peters was elected president of the section of otology of the Royal Society of Medicine in 1934 he chose as the subject of his address infection of the eustachian tube and pulmonary tract and in *Tonsils and Nasopharyngeal Sepsis* (1935) he showed his continuing interest in the relationship of infections of the throat to general disease. He was associated with Mr. Richard Lake in the preparation of the fifth edition of Lake's *Handbook of Diseases of the Ear* (1927). During the last war he served in the RAMC as otologist at the Royal Victoria Hospital, Netley, and with the late Sir Arthur Hurst in 1917 he contributed to our columns a provocative article on the treatment of hysterical deafness by "pseudo-operation."

Mr. Peters married Miss M. R. A. Mains and they had one son and three daughters, one of whom is now medical officer in an Ordnance factory.

THE LATE MR. JOLL

A colleague writes: The surgeon visiting London invariably went to watch Joll operate, for the technical beauty of his operating was well known, particularly to American and Dominion surgeons. If the sign of the expert is that he makes difficult jobs look simple, Joll was the most expert of operators. To him the operation seemed utterly effortless. He brought the same sureness of touch to his knife as the master brings to his brush. His operative achievements were feats of personal dexterity, and unlike Lane's his technique was not one that can be passed on from colleague to colleague.

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Joll rightly believed that the knife was the least traumatic of surgical weapons. "It all depends on getting into the right layer," he often pointed out as he was doing the goitre. He never divided the pretracheal muscles of the neck, and if asked would say, "divide them in your first 200 cases, after that you won't find it necessary"—and he was well over the 7000 mark. For an afternoon's operating, four goitres would form a minor part of his operating slate—20 minutes was an average time for a case. There never was any appearance of hurry, or rush, nothing slip-shod. He saved a little time by diathermising the superficial vessels. For dissection he used a blunt dissecting forceps rather than scissors, but primarily he defined everything with the point of his knife. Any small oozing vein on the gland he would cover with a small swab, maintain pressure, and continue operating. He used a needle-holder for sewing most layers, but within the abdomen he sewed by hand, with a curved needle, and he stitched his anastomotic layers neatly and very closely. He never seemed ruffled or ill-tempered with his assistants. But such coöperation came only from courteous training. His team were well drilled and had been taught how to give him ample exposure; the artery forceps had to be slapped into his hands. He never used a multitude of assistants, and except for the goitre operation (in which he had a few addenda) fancied no special instruments.

Joll was a natural operator, as a man may be born a natural cricketer. He had the eye, the "timing" to grasp with precision the bleeding deep vessel; he changed the "stance" of his hands as rapidly and as often as does the cricketer to meet the new demand. Even his feet were not lumps of standing clay as he operated, and he would move naturally to get into the most accessible position; thus he would edge his way to the patient's head as he took the vessels to the right lobe of the gland. He kept his large hands agile by constantly operating and he used them with grace—none of the gesticulations of the "showing-off" surgeon. But Joll enjoyed being watched; he was never "stage-struck" and could speed through the lists in spite of a large audience. He has been known to do a partial gastrectomy in 20 minutes, and on one occasion, while the patient was being turned from the abdominal to the perineal position in the course of an abdominoperineal operation, he went into the adjacent theatre and had completed an appendicectomy and returned by the time the patient was in the perineal position. Of course, he spared himself by getting his RSO to sew up for him, and he would work two tables. His outlook on life too saved him, for he was not given to brooding after operations, and he had a capacity for concentrating intensely and dismissing the operation from his mind once he left the table. He relaxed fully when his work was done, and would sit with limbs sprawling, utterly free in mind.

His surgical courage was great, and the cancer patient particularly could feel assured that the surgery would be heroic, and hope would not easily be abandoned. With the same courage he met the news that his days were numbered with a bon mot on his lips. He was not going to rest his bones on cushions. He went on operating, and ably too, until a fortnight before his death. He would have his deep X-ray therapy and then go to the theatre. He attended RSM meetings, and a week before his death he was revising a new edition of his goitre book, carefully checking every reference himself. To his many friends who called on him he never bemoaned his fate.

Beyond the circle of his colleagues it will be for his goitre work that he will be most widely remembered. Others may have made the patient safe for the goitre operation, but Joll helped towards making this once formidable operation safe for the patient.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.—The association is holding a refresher course at Manchester from April 23 to 28, and at Hairmyres Colony, Lanarkshire, from June 26 to 28. Further particulars from Dr. Harley Williams, Tavistock House North, London, WC1.

Dr. R. A. Young, has been elected vice-chairman of the association in the place of Sir Percival Horton-Smith-Hartley, who has retired.

Notes and News

INSTITUTE OF CHILD HEALTH IN LONDON

THE Hospital for Sick Children, Great Ormond Street, and the British Postgraduate Medical School, Hammersmith, have collaborated and produced a scheme under which it is hoped to found a chair in child health at the University of London. The scheme cannot be fully developed until after the war; but it is felt that, by establishing an Institute of Child Health forthwith, a useful start could be made. It is proposed that this shall be set up jointly at the two hospitals. When the department of child health is developed, two readers will be appointed to work under the professor, one at Hammersmith and one at Great Ormond Street. A report presented to the London County Council on Tuesday speaks of the value of an institute in training specialists in pædiatrics, and general practitioners, clinic officers, and medical, nursing, and social workers, and the importance of research with a view to the reduction of neonatal mortality. Such research can only be undertaken in a large obstetric unit.

The maternity unit at Hammersmith Hospital provides 71 cots and includes two well-equipped rooms, usually containing 6 to 8 premature babies born in the hospital. Its use would meet immediate needs, but it will be necessary later to provide a special unit where premature babies born at home (or at small hospitals or nursing-homes with inadequate accommodation) can be received with their mothers as early as possible after the confinements. With such a unit there would be approximately 60 normal infants and 20 premature infants under care.

The trustees of the Nuffield Foundation have allocated £10,000 a year for ten years for the endowment of a chair, and it is hoped that the salaries of the readers will be found from academic or other sources. The site, buildings, and staffing of the institute will require a large sum, and this may have to be raised by a public appeal which the chairman of the Hospital for Sick Children would sponsor. The hospitals committee of the LCC has recommended that the proposal to set up an institute should be welcomed and that existing facilities at Hammersmith Hospital should be made available immediately.

REABLEMENT

MORE than 250 hospitals in England and Wales are now using rehabilitation methods—including physiotherapy, remedial exercises, outdoor games, and handicraft. This is nearly twice as many as a year ago when the Ministry of Health appealed to civilian hospitals to start this work as soon as possible. Some hospitals are using local halls, others have been supplied with prefabricated huts and equipment by the Ministry. Most of the 400 hospitals covered by a recent Ministry survey had appointed a member of their medical staff as rehabilitation officer and many of these have attended special courses. When convalescence is ended the Ministry of Labour and National Service is ready to help the patient to find suitable employment or to attend a vocational training centre. Large firms in the neighbourhood of certain hospitals have also set up workshops in which disabled employees may begin their return to industrial life with suitably adapted work under proper supervision.

The Minister of Health has now turned to the Minister of Education for help in providing educational courses for civilian patients who are likely to spend long periods in hospitals or sanatoriums (MoH circular 5/45). Subject to medical approval, a patient will be put in touch with the local education authority who will arrange correspondence courses, visits from tutors, and the loan of textbooks for these hospital scholars. Service patients are covered by the War Office correspondence course scheme, but if they remain in hospital after invaliding they will become eligible for the courses offered by the local education authority.

FOR THOSE WHO HAVE MARRIED

THE Marriage Guidance Council, with the Bishop of London and Lord Horder as presidents, the Rev. Herbert Gray as chairman, and Mr. David Mace, PH D, as secretary, are interested in the survival of family life as the basis of a well-ordered society. The Council has at present one centre in London and hopes to open others in the provinces. The London centre is at 78, Duke Street, W1, where those needing advice may come by appointment to discuss problems of marriage and parenthood, and to receive medical, psychological, and legal help. This centre has been open for nearly

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two years and has dealt with upwards of 1000 cases. Advice is also given by correspondence, and courses of lectures and conferences are arranged. Recently a training school and conference were held at Jordans. It is not suggested that a week's course will by itself provide sufficient qualification for marriage counselling but "those who come to the courses are carefully selected people who already have some knowledge and experience in this field. The purpose of the course is to help to fill possible gaps in their knowledge and to aim at an agreed policy about the way in which certain problems are to be treated."

NOURISHMENT AT SCHOOL

SCHOOL meals and milk are not yet being taken by all the children for whom they are available; and the rise in numbers is subject to fluctuation. A falling off last year, temporary it is hoped, is recorded in a report presented to the education committee of the London County Council. The number of children receiving school dinners on a typical day in October, 1944, was 48,337, and the number taking school milk was 102,912. In addition 1519 attending day special schools had dinner. The proportion of children having meals and milk to the total numbers attending school that day were compared with the corresponding proportions on a day in the previous June, with the following results:

School	Meals		Milk	
	October	June	October	June
Elementary..	28·10%	33·63%	70·80%	72·59%
Secondary ..	68·81%	65·27%	61·71%	61·96%

Thus there was a slight fall in the proportion of children having milk and a more pronounced fall in the proportion taking school dinners. Since that time there has been a fairly steady rise, and by Nov. 24 the percentage of elementary-school children taking dinners had risen to 31·5. It would be instructive to know the causes of the temporary decline.

During the autumn holiday, Oct. 23–30, 50,769 dinners were provided in 224 centres, as compared with 23,207 dinners in 155 centres during the summer holiday of 1944 when rest centres were not available for the serving of meals.

CHAIR OF PSYCHIATRY AT THE MAUDSLEY HOSPITAL

Two university chairs are tenable at the Maudsley Hospital; but there has been no professor of psychiatry since Dr. Edward Mapother's death in 1940, and Prof. S. A. Nevin, who has held the chair of pathology since 1939, is at present on war service. A report presented to the London County Council last Tuesday refers to the Goodenough Committee's opinion that action must be taken to build up a supply of teachers of psychiatry, and its statement that at present the two principal centres for postgraduate psychiatric teaching are Edinburgh and London. In London the Maudsley Hospital occupies a special place, and it is felt that the time has come to fill the vacant chair in psychiatry. No salary is paid to the professors by the University of London, and the chair of psychiatry was formerly held by the medical superintendent of the Maudsley Hospital, who received from the LCC £1150 for part-time service.

The Goodenough Committee favoured whole-time salaried employment of professors, and it is accordingly proposed that the association of the chair with the post of medical superintendent shall be discontinued, and that a new post of director of clinical psychiatry shall be created. The new director's appointment, which is to be conditional on concurrent appointment to the university chair, will date from Sept. 1 next, and his salary will be £2000 with a war-time addition of £150. By arrangement, he will have facilities for teaching and research in any of the hospitals and institutions of the LCC.

TALENTS UNEARTHED

AT the end of last month the British Postgraduate Medical School and Hammersmith Hospital held an art exhibition, including contributions from the administrative, medical, technical, nursing, and domestic staffs.

In the large section devoted to painting the styles varied from the strictly representational to the decorative, the impressionist and the surrealist.

One could smell the dust on Dr. Charles Newman's amazing Bath Pipes, though they were scarcely realistic in the usual sense. Dr. Meave Kenny's self-portrait was treated realistically. The work of Dr. E. G. L. Bywaters ranged from a straightforward portrait to an unusual study of an acromegalic, a case of heart-failure, and an elaborate drawing of a retina. Mrs. K. M. Doyle sent in two attractive decorative panels, a study of Outpatients, and an amusing attempt to translate the subjective effects of 'Pentothal.' Mr. R. H. Franklin exhibited an attractive oil, View from a Window. Prof. G. Grey Turner brought out some sketches from a notebook of 1899 which induced regret that the sketch-book habit is no longer in vogue. Dr. E. J. E. Topham showed some pleasing pencil studies of heads and Dr. A. Preiss a tragic one of a Burned Airman in water-colour. Mr. M. V. Jay was successful in water-colour and pencil drawings of children, and Nurse H. Smallman contributed several good pictures, of which the best was a 15-minute sketch of a child.

Other sections included exhibits of toys, model ships, dolls' furniture of 'Perspex' plastic, rugs, 'book-binding, and embroidery. Among the bound books were two lovely examples by Dr. R. Turner.

The exhibition, which was opened by Sir Thomas Carey Evans, medical superintendent of the hospital, attracted keen interest. It should become an annual event and we hope its success will lead to emulation elsewhere.

University of Oxford

On Jan. 25 the following degrees were conferred:

DM.—*W. A. Young.

BM, B Ch.—N. D. Ashe, *A. G. Beckett, *B. A. Ellenberg, M. J. T. Hewetson, *M. R. Williams, *J. T. Wright.

* In absence.

University of London

The roll of honour published in the *Gazette* of Dec. 29 includes the names of the following medical men:

Staff.—Colonel Sir Norman Hill, RAMC, Major C. F. Rainer, RAMC, and R. R. Watts.

Graduates and Students.—Surgeon Rear-Admiral G. L. Buckeridge, RN, Surgeon Lieutenant G. S. Davis, RNVR, Captain M. Evnine, RAMC, Captain A. D. Fisk, RAMC, Major R. A. Foucar, RAMC, Colonel L. A. J. Graham, RAMC, Captain R. G. H. Jones, RAMC, Wing-Commander R. M. Outfin, RAFO, Captain J. T. Robinson, RAMC, Captain R. M. Sharpe, RAMC, Dr. L. J. Soutter, MB, BS, Major R. Stuppel, RAMC, Captain N. N. Wilson, RAMC, and Captain G. E. Yardley, RAMC.

The following have been recognised as teachers of the university:

Dr. A. N. Drury, FRS, as a teacher of pathology at the Lister Institute of Preventive Medicine; Dr. R. A. Gregory (physiology at University College); Dr. C. C. N. Vass (physiology at St. Thomas's Hospital medical school); Mr. J. Roydon Peacock (oto-rhino-laryngology at St. George's Hospital medical school); Dr. H. O. Schild (pharmacology at University College); Mr. R. Watson-Jones (orthopædics at the London Hospital medical college); Dr. Henry Wilson (mental diseases at the London Hospital medical college), and Dr. E. C. Amoroso (histology and embryology at the Royal Veterinary College).

University of Manchester

Dr. Brian Schofield has been appointed demonstrator in human physiology, and Dr. N. J. Caldwell demonstrator in pathology.

Department of Health for Scotland

Dr. R. J. Peters has been appointed deputy chief medical officer in the department in succession to Prof. T. Ferguson. Dr. W. D. Hood has also been appointed a senior medical officer in the department.

Dr. Peters, who is 49 years of age, was educated at Hutcheson's Grammar School, Glasgow, and graduated in medicine at Glasgow University in 1918. He entered the service of the Glasgow public health department in 1921, and was appointed deputy medical officer of health in 1935 and senior deputy medical officer in 1939. He served in the RAMC in the last war. With Prof. J. M. Mackintosh and Prof. C. F. W. Illingworth, Dr. Peters has been carrying out the survey of hospitals in the West of Scotland.

Dr. Hood has been on the staff of the department since 1938 and has been chiefly engaged on the establishment and development of the emergency hospital services. He is 44 years of age. He graduated in medicine at Glasgow University in 1922 and has held appointments in the public health service at Birkenhead, Croydon, Surrey, and Southport, and in the Factory Department of the Home Office.

Faculty of Radiologists

The therapy section of the faculty will meet at the Royal College of Surgeons, Lincoln's Inn Fields, London, WC2, on Friday, Feb. 16, at 2.30 PM, when Dr. Robert McWhirter, Dr. H. D. Wyatt, and Dr. F. Hernaman-Johnson will open a discussion on ankylosing spondylitis.

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Royal College of Physicians of London

Mr. B. H. C. Matthews, SC D, FRS, will deliver the Oliver-Sharpey lectures at 4 PM on Tuesday and Thursday, March 13 and 15, at the college, Pall Mall East, SW1. He is to speak on the effects of high altitude and mechanical stresses on man

Royal College of Surgeons of England

The first course of professorial lectures on anatomy and applied physiology will be delivered at the college, Lincoln's Inn Fields, WC2, on Mondays, Wednesdays, and Fridays from Feb. 19 to March 16. Prof. John Beattie will give the lectures on applied physiology at 2.30 PM, and Prof. A. J. E. Cave the lectures on anatomy at 4 PM. Fellows and members of the college are entitled to attend, and on this occasion the lectures are also open without fee to other medical practitioners and advanced students.

Society of Apothecaries of London

Mr. Eardley Holland, FRCOG, will speak at the Apothecaries Hall, Black Friars Lane, EC4, on Tuesday, Feb. 20, at 2.30 PM. His subject is to be the new obstetrics and gynæcology.

Middlesex County Medical Society

A meeting will be held at Staines County Hospital, on Thursday, Feb. 22, at 3 PM, when Dr. A. Barham-Carter will speak on the treatment of some hysterical manifestations and Mr. N. M. Matheson on the diagnosis of urinary tuberculosis.

Science (Research) Society

Dr. G. Scott-Williamson will take the chair on Saturday, Feb. 24, at 3 PM, at BMA House, Tavistock Square, London, WC1, when Mr. E. W. Russell and Lady Eve Balfour will open a discussion on soil biology.

Royal Society of Tropical Medicine and Hygiene

At 26, Portland Place, London, W1, on Thursday, Feb 15, at 3 PM, Prof. P. A. Buxton, FRS, will speak on the use of the new insecticide DDT in relation to the problems of tropical medicine.

Poliomyelitis in USA

In his birthday message broadcast from the White House on Jan. 30 by Mrs. Roosevelt, President Roosevelt said that the 1944 epidemic of poliomyelitis was the worst since 1916. But thanks to public support for the National Foundation for Infantile Paralysis the very best in medical care and treatment had been assured for everyone.

Royal Dental Hospital of London

Sir Robert Hutchison has been appointed consulting physician in succession to the late Sir Humphry Rolleston.

Medical Society of London

On Monday, Feb. 12, at 5 PM, at 11, Chandos Street, W1, Sir Alexander Fleming, FRS, and Dr. Izod Bennett will open a discussion on the uses and limitations of penicillin treatment.

Films on Anæsthesia

The three films reviewed in THE LANCET of Dec. 9, p. 773, can be hired from the Central Film Library, Imperial Institute, Exhibition Road, SW7.

Mass Radiography in London

During its first year of work the London County Council's mass-radiography unit examined patients and staff (3810 people) at two large mental hospitals. Of 45,682 other persons examined, including workers in factory and office, Civil Defence personnel, and children in secondary schools, 335 (0·73%) were referred for further investigation, and of these 112 (0·24%) were advised to enter hospital or sanatorium. Heart abnormalities were discovered in 83 cases. The unit has operated at five static centres, but as soon as conditions permit the apparatus will be taken to the worker, rather than the worker to the unit.

Science in Peace

The Association of Scientific Workers is holding a national conference on this subject on Feb. 17 and 18 at the Caxton Hall, Westminster. At the first session, on Saturday afternoon, the conference will consider ways of securing an expanding economy and full employment. On Sunday morning it will deal with the future development of science. At the final session on Sunday afternoon, devoted to science in everyday life, the speakers will include Mr. F. Le Gros Clark, Dr. H. Joules, and Prof. J. D. Bernal, FRS. Information and tickets from Mrs. B. Ryerson, A SC W, Hanover House, High Holborn, London, WC1.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED JAN. 27

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1510; whooping-cough, 1625; diphtheria, 450; paratyphoid, 3; typhoid, 3; measles (excluding rubella), 12,941; pneumonia (primary or influenzal), 1397; puerperal pyrexia, 141; cerebrospinal fever, 81; poliomyelitis, 7; polio-encephalitis, 0; encephalitis lethargica, 3; dysentery, 295; ophthalmia neonatorum, 47. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Jan. 24 was 952. During the previous week the following cases were admitted: scarlet fever, 33; diphtheria, 21; measles, 75; whooping-cough, 24.

Deaths.—In 126 great towns there were no deaths from enteric fever, 12 (0) from measles, 2 (0) from scarlet fever, 14 (1) from whooping-cough, 4 (0) from diphtheria, 46 (5) from diarrhœa and enteritis under two years, and 87 (11) from influenza. The figures in parentheses are those for London itself.

There were 9 deaths from diarrhœa at Birmingham. Birmingham reported 5 fatal cases of influenza, and Reading 4.

The number of stillbirths notified during the week was 198 (corresponding to a rate of 31 per thousand total births), including 18 in London.

Appointments

GIBSON, T. J., MB BELF., FRCSE: temp. full-time MO at Banbridge Hospital, co. Down.

O'CALLAGHAN, DESMOND, MB LOND., FRCS: acting surgical registrar, Westminster Hospital.

Births, Marriages, and Deaths

BIRTHS

BALLANCE—On Jan. 20, at Oxford, the wife of Surgeon Lieutenant G. A. Ballance, RNVR—a son.

CUMMING.—On Jan. 29, in London, the wife of Lieutenant Alister Cumming, RAMC—a daughter.

HORGAN.—On Jan. 24, at Tralee, Eire, to Dr. Gwen Horgan (née Richards), the wife of Mr. M. J. Horgan, FRCS—a daughter.

ROBERTSON.—On Jan. 29, to the wife of Dr. J. M. Robertson, of Evesham—twin daughter and son.

STROTHER-STEWART.—On Jan. 27 in Edinburgh, the wife of Captain C. R. Strother-Stewart, RAMC—a son.

JACKSON.—On Jan. 31, in Birmingham, the wife of Captain Ian M Jackson, RAMC—a son.

MARRIAGES

FIGGIS—HARGREAVES.—On Jan. 27 at Harrow-on-the-Hill, Morton Figgis, captain RAMC, to Jean Mary Hargreaves.

HOLDEN—SWAN.—On Jan. 30, at Shaftesbury, John Rushworth Holden, captain RAMC, to Bridget Mary Swan, VAD.

KERR—GOAD.—On Jan. 29, at Plymouth, David Kerr, surgeon lieutenant RNVR, to Gwyneth Goad, second officer WRNS.

PITTS—CLAPHAM.—On Jan. 31, at Woodbridge, Robert MacLaren Pitts, surgeon lieutenant RNVR, to Eunice Joan Clapham, second officer WRNS.

DEATHS

BUTLER.—On Jan. 29, at Hampton-in-Arden, Thomas Harrison Butler, DM OXFD, FRCS, aged 73.

COGAN.—On Jan. 24, at Chapel-en-le-Frith, Denis Cogan, LRCPE.

GILL.—On Feb. 2, at Hove, Samuel Ernest Gill, MD LOND., aged 74.

GLEESON.—On Jan. 30, at Dublin, Ella Gleeson, LRCPI.

HOLMES.—On Jan. 29, at Langley Mill, Derbyshire, Arthur Marson Holmes, MB EDIN.

KITCHIN.—On Feb. 5, Mary Kathleen Forsaith Kitchen (née Lander), MB, MSC LOND., barrister-at-law, Gray's Inn.

PETERS.—On Jan. 29, Edwin Arthur Peters, MD CAMB., FRCS.

ROBINSON.—On Feb. 2, at Stourport-on-Severn, Edward Stanley Robinson, MRCS, aged 79.

SELLERS.—On Jan. 31, at Chesham Bois, Bucks, Arthur Sellers, MD EDIN.

STAMBERG.—On Aug. 19, in Jersey, Arthur Clement Stamberg, OBE, MB EDIN., DCMS, Ministry of Pensions, Channel Isles area.

WOODCOCK.—On Jan. 29, at Rottingdean, Oswald Hampson Woodcock, MD MANC., aged 67.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

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ABDOMINAL INJURIES AT THE BASE HOSPITAL

R. MILNES WALKER, MS LOND., FRCS
W. R. S. HUTCHINSON, MB CAMB., FRCS
SURGEONS, ROYAL HOSPITAL, WOLVERHAMPTON, AND EMS

A LARGE number of general hospitals accustomed to dealing with civilians only are now acting as base hospitals, and treating casualties any time from 12 hours upwards after their wounds have been inflicted. Since base hospitals are now established on the Continent, it is unlikely that casualties will continue to arrive at quite such an acute stage of their illness, but some notes on the treatment of abdominal injuries in this phase may serve as a guide to those who will continue this work elsewhere. This aspect of abdominal injuries has been singularly neglected. Much has been written during this war on the methods to be employed in the forward areas, and judging by those patients who have been evacuated to Britain from the Continent during the present campaign this treatment has been of the very best, and in some instances, as will be quoted, has yielded miraculous results. There is a general feeling however that if these patients survive the primary operation, and if their general condition is such that they can be evacuated to the base, all problems are solved and future treatment is straightforward. This is not the case; subsequent management may present many difficulties which if not dealt with properly and promptly may prolong the period of disability and even lead to disaster. This was brought home to us by the example of a sapper who was wounded in Italy in August, 1943, a shell fragment entering the left loin and perforating the descending colon, and who was only able finally to leave hospital with his wounds healed in November, 1944, fifteen months after his injury.

A careful record has been kept of the casualties with intra-abdominal injuries admitted to a group of civilian hospitals during the early stages of the campaign in the west, and the following notes are based on these records. They comprise 55 cases, wounded either in Normandy or in the early stage of the battle in Belgium and Holland, and practically all were evacuated from the Continent by air transport, arriving at their destination between the 2nd and 30th days after injury. Some were detained at a Royal Air Force reception hospital for a few days after the journey by air, and 6 received treatment at other hospitals in Britain before being transferred to this group. They include casualties with damage to the peritoneum, to abdominal viscera, or to the anal region necessitating a colostomy. The nature of their injuries can be summarised as follows:

Peritoneum penetrated					46
No visceral injury			3 (1 death)		
Visceral injury			43		
Peritoneum not penetrated					9
Visceral injury			5		
Colon		1			
Rectum		3			
Rectum and bladder		1			
Anal or perineal injury			4		
Total cases					55

Site of 48 Visceral Injuries

Stomach	4	Spleen	3
Small intestine	22	Kidney	4
Colon	20	Ureter	1
Rectum	5	Bladder	7
Liver	9	Abdominothoracic	8

In 20 cases more than one viscus was injured, while in 9 of these both the small and large intestines suffered. No fewer than 28 (51%) had colostomies or wounds communicating with the colon, and the closure of these fistulæ forms a considerable part of the work of the surgeon at this stage. One had two separate colostomies, and as many as 5 had both a colostomy and suprapubic drainage of the bladder. In spite of such severe injuries, almost without exception the patients arrived in good condition, a tribute to their early treatment and to the organisation of their transport. To date there have been no deaths among this group after arrival in the area, with the single exception of one patient who had no visceral injury but died from septicæmia due to suppurative arthritis following an open wound of the knee-joint. Tribute must also be paid to the excellent records on the field medical cards, from which much of the information on which this paper is based has been culled; these notes were often made under most difficult conditions.

OVERLOOKED INJURIES

The surgeon at the base hospital must be constantly vigilant, when casualties first arrive, for any injuries which have been overlooked further forward. The standard of field surgical units is so high that these cases must be rare but that they do occur is evident from the following 2 examples, both emphasising the well-known risks of an entry wound in the buttock area.

Private A, wounded in the right thigh 1 inch below the ischial tuberosity. At the CCS toilet of the wound was carried out, but no foreign body was found. A catheter was passed, but the urine was not blood-stained so it was concluded that there was no injury to the bladder. On arrival in this country 48 hours after the wound was inflicted he complained of a little lower abdominal pain, and on questioning admitted that his urine had been blood-stained, though he had passed it freely. Cystoscopy was attempted, but lotion run into the bladder was not returned, and the organ could not be distended. On suprapubic exploration a prevesical hæmatoma was discovered, with perforations in the anterior and posterior walls of the bladder. A fragment of the ischial ramus lay free in the bladder, and the missile, a piece of metal ½ in. long, was in the peritoneal cavity wrapped in omentum. After removal of these fragments, repair of the bladder, and drainage of this and the prevesical space, he made an uneventful recovery and all wounds were healed 5 weeks later.

A rifleman received a wound in the right buttock ½ in. from the anus, as well as a penetrating wound of the right knee-joint. The wounds were excised by a field surgical unit, and the leg put in a Tobruk plaster. When he arrived in this country 2 days later his condition was poor, and he passed very foul urine. At operation the presence of a rectovesical fistula was confirmed, but there was no free fluid or foreign body in the peritoneum. An iliac colostomy was performed, and the bladder drained by a urethral catheter; 13 days later cystoscopy was carried out by Mr. Hugh Donovan, and the foreign body was seen lying inside the bladder; it was removed by suprapubic cystotomy and measured 1 in. by 1/5 in. The fistula healed without further operative intervention, and it was possible to close the colostomy a month later.

INTESTINAL OBSTRUCTION BY ADHESIONS

Men who have had intraperitoneal injuries are liable to acute intestinal obstruction as a result of adhesions at any time during the postoperative period or later, but they seem to be particularly prone to this about the 4th to the 6th week. Three examples have occurred in the present series, on the 21st, 32nd, and 36th days, and in all of them perforations of the small intestine had been repaired. The characteristic symptoms should therefore be watched for and appropriate action taken. In each of the cases in this series the obstruction was caused by a single band strangulating a loop of small intestine, but other less firm adhesions were also present; one of these patients had such extensive injuries that the account on his field card reads like a myth and the highest tribute is due to Major L. R. Rabson and his associates at the 3rd Canadian CCS who were responsible for his early treatment. We quote from his card—

"Corporal B, Polish Army. Penetrating abdominal wound, exit left upper loin, arrived CCS 1500 hr. Operation 2100 hr. Incision left loin, separation of diaphragm on left side from ribs, hæmopneumothorax, fractures 8–12 ribs, diaphragm deficient in anterior part. Peritoneum sutured to chest wall here to close sucking, and 'Vaseline' pack inserted. Suction of blood as much as possible with positive pressure on lung. Laceration of transverse colon; exteriorised through wound. Laceration of spleen; splenectomy. Three lacerations of jejunum; sutured. Abdomen incompletely closed, anterior wound excised. Scalp wound and wound of left elbow untouched—condition too poor." Unfortunately the records of this remarkable case do not give details of the resuscitative measures, but gastric suction was maintained for 7 days, and

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1½ million units of penicillin administered systemically during this period. He was evacuated by air 19 days later. On arrival at the base hospital his general condition was excellent, the left lung was fully expanded, and there was no fluid in the left pleura; pus was discharging freely round his colostomy and he had some fever. A fortnight later he suddenly showed symptoms of acute intestinal obstruction, and operation revealed that this resulted from strangulation of a loop of small intestine by a band running from the mesentery to the jejunum at a point where it appeared that the latter had been sutured. Since then a sequestrum from the 9th rib has been removed, and the colostomy closed after preliminary crushing of the spur 15 weeks after his injury. At this last operation it was noted that the opening through which the colon had been brought out was situated entirely above the costal margin between the 8th and 11th ribs, so this must be a unique example of a truly thoracic colostomy.

CLOSURE OF COLOSTOMIES

It has already been noted that more than half these patients had a fistula into the colon. They fall into two groups—those with a formal artificial anus performed at the primary operation, and those with a fæcal fistula through the wound which developed either at the time of injury or as the result of sloughing of the wall of the colon.

In warfare an artificial anus is made either to exclude the flow of fæces from an injured portion of the colon or rectum, in which case the site is in the transverse or sigmoid portions, or to exteriorise an injured segment of the bowel, when it may involve any part of the large intestine from the cæcum to the sigmoid. When performed as an exclusion operation it will almost certainly have a satisfactory spur which can be crushed in order to facilitate closure, but when an injured loop has been exteriorised there is often no such spur and the two ends of the loop diverge. How soon can such an artificial anus be closed?

When the actual injured part has been exteriorised, and there is no lesion in the intestinal tract lower down, closure may be performed as soon as the patient's general condition is satisfactory and any local inflammation round the opening has subsided. In one case it was possible to do this 17 days after the injury, but usually the period is rather longer. Where there is injury lower down closure should be delayed until it is quite certain that the wound in the colon or rectum is soundly healed, and if in doubt it is better to err on the longer side, for these wounds have an unpleasant knack of breaking down again if they become contaminated by fæces before they are completely epithelialised. It may be necessary to inspect the rectum with a sigmoidoscope, or to inject opaque oil or a coloured dye into the wound to make certain that the fistula is closed, but it is not always practicable to wait until the sinus is quite healed because this may considerably delay the patient's eventual recovery.

The technique of closure has been admirably described by Turner Warwick (1943), whose account is commended to all who treat these cases. We prefer the intraperitoneal method as a routine for the following reasons: (1) the wider exposure of the loop of colon allows more accurate suturing without tension; (2) it is sometimes found that another organ such as small intestine is adherent to the loop and can be freed; (3) the opening in the abdominal wall can be repaired with reduced risk of a subsequent hernia; (4) it can be ascertained with certainty that there is no kinking. If it appears that the lumen will be reduced when the suturing is completed, incisions should be carried upwards and downwards along the antimesenteric border of the colon and included in the suture line. In some of our cases the colostomy head has been swollen because the opening in the parietes has been too small, possibly as a result of scarring. In such cases the thickened mucosa is excised, and in a few instances it has been found advisable to remove the whole circumference of the bowel and perform an end-to-end anastomosis.

With careful operative technique the risk of peritoneal infection is slight. Sulphanilamide powder is dusted over the suture line before the abdomen is closed, and preoperative lavage of the colon both above and below the stoma is most important. There is evidence that the administration of sulphasuxidine in doses of 20 g. a day for 4 days diminishes the bacterial flora of the colon to a remarkable extent (Mackenzie 1944) and its use should not be omitted.

Fæcal fistulæ through wounds in the flanks, particularly if associated with osteomyelitis of the ileum or lower ribs, need special consideration. No real improvement in the local infection can be hoped for while fæcal contamination continues, and steps should be taken to check this as soon as the patient's condition permits, if it has not already been done at the primary operation. When the wound affects the right half of the colon the fistula is best closed by performing an end-to-side anastomosis between the lower end of the ileum and the transverse colon; such an operation involves no interference with the infected area round the wound, and in the one case where this step was taken the immediate improvement in both general and local conditions was striking.

Trooper C sustained multiple wounds of the chest wall, right flank, right buttock, and both thighs. At operation a compound fracture of the ilium was noted, but laparotomy revealed no intraperitoneal injury. Five days later a fæcal fistula was present just above the iliac crest. On his arrival at the base hospital following evacuation by air after another 5 days, his condition was only fair, and fæces were pouring from two wounds in the right flank. A fortnight later an ileocolostomy was performed, secondary suture of some of his other wounds being carried out at the same time. He made great improvement, and 3 weeks later all wounds were healed except the two in the right side. Some sequestra from the iliac bone were removed, and now 3 months after his injury the only wound is a small opening just admitting a finger tip through which cæcal mucosa prolapses. He is at the time of writing on "compassionate" leave because his wife has given birth to twins, but will have the fistula closed as soon as he returns.

In dealing with infected wounds of the left side of the colon causing extraperitoneal fistulæ it is necessary to carry out a transverse colostomy, and exclude the flow of fæces from the wound before attempting to close the fistula. When the infection has been overcome, the opening in the colon should be adequately exposed, a step which may necessitate opening the peritoneum, and the defect carefully closed without tension. Some mobilisation of the colon may be required to effect this because it is apt to have become fixed by adhesions.

SMALL-INTESTINE FISTULÆ

Only 2 fistulæ of the small intestine occurred in this series—one had been performed as an ileostomy on the sixth postoperative day to relieve distension, and had closed spontaneously when the patient arrived at the base hospital; the second was discharging jejunal contents profusely, and had to be closed by operative means at an early date because his nutrition was inadequate. For this last reason jejunal fistulæ may be very serious, and if the patient is losing weight there should be no delay in closing such openings even if the patient's condition is poor.

WOUNDS OF THE RECTUM AND PERINEUM

Penetrating wounds of the buttock were common during the Normandy campaign, and such wounds are particularly likely to give rise to retroperitoneal injury of the rectum. These patients will usually have had an iliac colostomy performed before they arrive at the base, but an example already quoted indicates that such injuries may be overlooked. Adequate drainage of the postrectal space is essential, and if there is any sign of spreading infection the coccyx must be removed and the space as far up as the wound in the rectum laid open and loosely packed with vaseline gauze. Some of the smaller perforations close spontaneously when a colostomy has been performed, but others remain as fistulæ which gradually acquire rigid margins and fix the rectum to the sacrum, thus making repair difficult. Much time and trouble might be saved if an attempt were made at the primary operation, when the colostomy is done, to close the perforation in the rectum if it is accessible at the time the postrectal space is drained; this should of course only be done if the patient's general condition warrants the extra time taken, and there is not already a spreading cellulitis. The colostomy should not be closed until it is quite certain that the

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fistula is healed, and it may be advisable to verify this by examination with the sigmoidoscope.

Wounds of the perineum have been included in the series when they have been severe enough to warrant a colostomy, which saves much time in procuring healing. When the danger of contamination is removed secondary suture or skin-grafting can be carried out; one such case in this series is complicated by osteomyelitis of the ischium.

SUPRAPUBIC CYSTOTOMY

Some say there is no need to suture wounds of the bladder, provided adequate drainage is carried out, but the failure to do so at the primary operation may lead to serious consequences, as is illustrated by the following case.

Private D. received a rifle wound, the bullet entering the left loin and coming out through the right thigh. Laparotomy 21 hours later showed a badly damaged loop of ileum which was removed. Tears in the muscular coat of the rectum were repaired, and of the two large wounds present in the bladder the one on the left side was sutured and suprapubic drainage established. A week later he was passing urine by the urethra. A month afterwards urine began to leak from the exit wound in the thigh, and he developed an acute suppurative arthritis of the right hip. The suprapubic fistula was reopened, the bladder dissected free from the right side of the pelvis, and the perforation in this situation sutured. At the same time the thigh wound was widely opened and drained, and it appeared that there had been a fistulous track from the bladder, through the hip-joint, into the thigh. After this operation he has been making steady progress.

Wounds in the bladder should therefore be repaired at the primary operation whenever possible, in addition to the establishment of suprapubic drainage. Provided this has been done, and unless the bladder is grossly infected, the suprapubic tube may be removed 2 weeks after the injury, and in all probability the urinary fistula will close in a few days. No difficulty has been experienced in the remaining six cases of bladder injury in this series. When there is both a suprapubic drain and a colostomy the bladder can usually be allowed to close first, but if further operative measures are required on the bladder, and none on the colon or rectum, the colostomy is closed first and thus a cleaner field can be secured for the bladder repair. If operative measures are to be carried out on the urethra by the perineal route they should be undertaken while the fæcal flow is still diverted from the anus. We have encountered 2 patients (not included in this series) in whom a suprapubic cystotomy had been performed for wounds of the penile portion of the urethra. No noticeable difference in healing has been observed when these are compared with others in whom the urinary flow had not been diverted, and it seems unnecessary to do a primary suprapubic cystotomy in these cases.

ABDOMINOTHORACIC WOUNDS

This series contains 8 patients in whom the pleural and peritoneal cavities were opened by the same missile. Two of them showed no complication of their chest injury. One of these, already described, had severe injuries, but after the torn diaphragm had been sutured to the chest wall at his first operation he needed no further attention to his pleural cavity. In the second the wound, which led through the diaphragm into the liver, was packed, and secondary suture was carried out 3 weeks later.

One patient had necrosis of the 6th left costal cartilage, and the whole of this cartilage had to be removed eventually. In another patient, who had a penetrating wound of the right lower chest, no abdominal lesion was suspected until he discharged fæcal-smelling fluid containing bile on the 9th day after his injury, evidently the consequence of damage to his liver; no further operative treatment has been required and his wounds healed soundly, but two metallic foreign bodies, one just above and the other below his diaphragm, remain.

One soldier whose spleen and colon were injured, as well as the pleura and diaphragm, had a hæmothorax which required aspiration on three occasions, while 3 others had blood-stained effusions which became infected and needed drainage either by rib-resection or intercostal catheter; one of these had injuries to the stomach, colon, and liver, and another to the colon, liver, and one kidney.

RESIDUAL ABSCESS

It stands to the credit of the efficient treatment which this group of patients received in the early stages that in only one of them was there a residual abscess in the peritoneal cavity—a pelvic abscess following injury to the stomach and liver. Such an abscess must be watched for, particularly in the pelvis and subphrenic region, and must receive appropriate treatment. The routine use of intraperitoneal sulphonamides and systemic penicillin may have contributed to the almost complete elimination of this complication. A number of patients in this series still had a degree of anæmia when they arrived at the base which required treatment with iron and on a few occasions by blood-transfusion.

CONCLUSION

In 55 soldiers wounded in the abdomen during the campaign in Normandy and the Low Countries, a review has been made of the treatment and complications after they had arrived at civilian base hospitals in the United Kingdom. They are, of course, a selected group, in view of the fact that they were considered fit to be evacuated by air, and no conclusions can be drawn from them regarding methods of primary treatment or the mortality-rate. Very few of them caused anxiety on arrival, in spite of extensive injuries, and we can only attribute this to the liberal employment of blood, plasma, and saline infusions, to routine gastric suction, to systemic penicillin therapy in every case, and to the policy of exteriorising or excluding all wounds of the large intestine. Many of these patients had other wounds apart from their abdominal injuries, but in almost every case it was the wound in the belly which dominated the clinical picture.

On arrival of a convoy, patients who have had wounds of the abdomen or of the buttock should be examined as soon as they are settled in bed, and any untoward symptoms such as pain, vomiting, or hæmaturia must be accounted for, and raising of the pulse-rate or temperature explained. Pain or fever may be due to a residual abscess in the abdomen, or to an infected wound which is draining inadequately. A full course of systemic penicillin therapy will probably have been administered before arrival at the base, but if this is not the case, or if there are any signs of spreading inflammation, systemic penicillin should be instituted at once, in the latter instance without waiting to determine the nature of the infecting organism. A further course of penicillin should be instituted shortly before undertaking any operation on an infected abdominal wound provided the infecting organism is penicillin-sensitive. The onset of vomiting and colicky pain should arouse the suspicion of acute intestinal obstruction by a band, and if examination supports this diagnosis laparotomy should be undertaken at once.

With the exception of fistulæ into the upper part of the small intestine, there is no hurry about the closure of colostomies and other fæcal fistulæ, and the patient's general condition should be adequately restored first. Most small intestine fistulæ will close spontaneously, but not those of the colon or rectum. As a general rule such fistulæ are not finally closed until any other wounds which the patient has received are healed, and often a series of operations are necessary to close them. However, when fæcal contamination of a wound is a cause of continued suppuration, with resulting persistent toxæmia, steps must be taken to divert the flow of fæces, either by a short-circuit operation or by a proximal colostomy. Scrupulously careful technique is essential if the operations for closure of fæcal fistulæ are to be uniformly successful, while scarring and adhesions may add to the difficulties.

Suprapubic bladder fistulæ usually close spontaneously, but before removing the tube it is essential to be sure that the wounds in the bladder are healed and that there is no obstruction to the urethra; if the bladder wounds have not been sutured at the primary operation they may require repair later. Abdominothoracic wounds, after their early treatment, present no peculiar problems, the injury to each cavity requiring attention as a separate entity, provided no communication between the two cavities persists.

Many of these patients have, when healed, large scars in the abdominal wall which may be a source of weakness,

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but a period of rehabilitation does much to restore their strength and their self-confidence.

Undoubtedly other complications will arise which we have not encountered in this short series, but our experience and conclusions are put forward in the hope that others with a larger experience will add their views on an aspect of treatment of abdominal injuries which has been rather neglected.

It is comforting that none of them suffered in any way from their early evacuation to England, thanks to the excellent organisation of the air-transport service. Though their treatment is not yet completed, there is every reason to suppose that, with the exception of one man who died as a result of another wound, they will all survive, and will be left with little or no permanent incapacity as a result of their abdominal injuries.

We wish to thank our colleagues under whose care some of these patients were admitted, and who have carried out the treatment and permitted us to make use of the records: Mr. Vincent Patrick, Mr. John Stretton, Dr. J. E. Stanley Lee, and Mr. W. E. Wimberger; also Mr. B. Lawson who kept the records at one hospital for us.

REFERENCES

Mackenzie, D. H. (1944) *Brit. med. J.* ii, 722.
Warwick, W. T. (1943) *Practitioner*, **151**, 156.

HUMAN TRANSMISSION OF INFECTIVE HEPATITIS BY THE ORAL ROUTE*

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THE experimental transmission of infective hepatitis to man has rapidly added to knowledge regarding this disease. From such experiments as have been published, it now appears that infective hepatitis can be transmitted to man by a number of routes; that the ætiological agent (probably a virus) is in the blood-stream before the onset of and during jaundice; and that it is present in fæces during acute stages of the disease, and probably also in nasal washings. From certain newer (unpublished) experiments by one of us (W. P. H. and collaborators) it also appears that the agent of infective hepatitis can be carried in serial passage in man (2 passages), thus conclusively indicating the infectious nature of the disease, and that like the agent of serum jaundice (with which it may be identical) it is filtrable and markedly heat-stable, withstanding 56° C for half an hour. All this work has been carried out within the past 2 or 3 years and a list of some of the pertinent reports is given in the table.

Among early claims of success in transmission are those of Voegt (1942) in Germany. Details of this work are incomplete. Voegt describes having infected one out of four volunteers by feeding them duodenal fluid obtained from two patients who were late in the clinical course of infective hepatitis. He also claims to have produced hepatitis experimentally, by inoculation of human serum and by the ingestion of urine, and of hæmolysed red blood-cells.

In Lieut.-Colonel Cameron's investigations (1943), carried out in Palestine, serum and whole blood from cases of hepatitis were injected intramuscularly. Seven volunteers were inoculated, of whom six could be followed. One of these developed jaundice after 30 days. During the next 6 months all the rest developed jaundice, although details as to the time of onset are not available.

SERUM JAUNDICE

Included in the table are certain transmission experiments on homologous serum jaundice, because it has not yet been shown that the icterogenic agent responsible for serum jaundice is any different from that responsible for infective hepatitis. A discussion of this subject will be found in the recent papers by Findlay, Martin, and Mitchell (1944). Among the early planned transmission experiments in serum (post-vaccinal) jaundice were those of Brigadier Findlay and Major Martin (1943). They used nasal washings taken from three patients in the pre-icteric or early icteric stages of jaundice developing after inoculation against yellow fever. The material was administered intranasally, or orally. Resulting experimental cases were mild, and more or less indefinite. They occurred after incubation periods of 28, 30, and 50 days. In the United States, Oliphant et al. (1943) of the United States Public Health Service have made an extensive series of tests on the transmission of serum jaundice by subcutaneous inoculation in more than a hundred subjects. The incubation periods in their series of inoculation cases ranged from 75 to 130 days. In England, MacCallum and Bauer (1944) have confirmed the results of both groups of workers. Similar confirmation of this work on serum jaundice has come from two of the commissions working under the Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the US Army (Paul et al 1944, Stokes 1944).

In summary of all this recent experimental work it now seems that serum jaundice, which has not been considered as "contagious" as infective hepatitis, can possibly be transmitted by nasopharyngeal washings with a relatively short incubation period. Data on the infectivity of the fæces in serum jaundice as yet are unavailable. Furthermore, although the icterogenic "capacity" of various lots of serum, or individual samples of serum, differs in the rates at which serum jaundice is produced, as well as the lengths of the incubation period, the majority of such inoculation cases, whether induced by the intracutaneous, subcutaneous, intramuscular, or intravenous routes, have occurred after a relatively long incubation period, generally ranging from 60 to 100 days. This conforms to the usual experience in outbreaks of jaundice following the administration of yellow-fever vaccine or icterogenic serum, of which there are many reports.

HEPATITIS VIRUS IN FÆCES

These experiments on serum jaundice have now paved the way to a new and important series of discoveries which indicate that in infective hepatitis (whose incubation period is about 30 days) the virus is in the fæces, and that the disease can be induced (after a "30 day" incubation period) by feeding such material to volunteers. This finding has been reported recently in a short note by MacCallum and Bradley (1944). Their material was collected from several individuals in the pre-icteric stage of infective hepatitis or within 24 hours of the appearance of jaundice. Positive results were obtained both from nasopharyngeal washings (which gave rise to subicteric hepatitis in volunteers) and from fæces (which gave rise to hepatitis with jaundice) when fed or sprayed into the nose and the pharyngeal region of persons suffering from rheumatoid arthritis. The experimental disease thus produced occurred in a small number of instances after a relatively short incubation period—27 to 31 days in rheumatoid arthritics.

These results have also been confirmed and somewhat enhanced by recent experiments of the Neurotropic Virus Disease Commission of the US Army (Havens et al. 1944) who have employed healthy human subjects for their tests. Material from cases of infective hepatitis (and serum jaundice) collected from American and British troops in the Middle East, was administered by various routes to five different groups of human volunteers. Preliminary data on this work are also included in the table. Briefly the main findings in this last group of experiments can be summarised as follows.

When one lot of icterogenic serum was fed in gelatin capsules to three men, two of them contracted hepatitis with relatively short incubation periods of 30 days, and a third after a longer incubation of 84 days (this last case was insidious in onset, mild, and non-icteric and is therefore not included in the table).

When fæcal material was fed in a similar manner—together with urine and stool extracts which had been

* Work done largely under the Commission on Neurotropic Virus Diseases (Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Service, Office of the Surgeon General, US Army).

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EXPERIMENTAL CASES OF HEPATITIS WITH JAUNDICE IN VOLUNTEERS AS REPORTED BY VARIOUS INVESTIGATORS

Parenteral administration						
Authors	Year	"Inoculum"[1]	Route inoc.[2]	No. tested	No. pos.[3]	Incubation period (days)
Voegt	1942	Serum—IH	sc	?	1	19(?)
Cameron	1943	Blood / Serum } IH	im	6	6	30–120(?)
Oliphant et al.	1943	Serum—SJ	sc	104	16	84 ±
MacCallum and Bauer	1944	Serum—SJ	sc	15	6	54–127
MacCallum and Bradley	1944	Serum—IH	sc	6	3	64–92
Paul et al.	1944	Serum { "SJ" / SJ	sc / ic	10	7	72–94
Stokes and Neefe	1944	Serum—SJ	iv	6	5(?)	73–142
Havens et al.	1944	Serum { SJ / "SJ"	ic	5	3	56–70

Oral (or nasopharyngeal) administration						
Authors	Year	"Inoculum"[1]	Route inoc.[2]	No. tested	No. pos.[3]	Incubation period (days)
Voegt	1942	Duodenal fluid—IH	oral	4	1(?)	28
,,	1942	Urine—IH	oral	?	1	?
,,	1942	Blood—IH	oral	?	1	?
Findlay and Martin	1943	Nasal wash—SJ	in	4	3(?)	28–50
MacCallum and Bauer	1944	Serum—SJ	in	10	1(?)	36 (80)
MacCallum and Bradley	1944	Nasal wash—IH	in	16	0	..
,,	1944	Urine—IH	in oral	19	0	..
,,	1944	Fæces—IH	in	26	3	27–31
Havens et al.	1944	Serum—"SJ"	oral	3	0	..
,,	1944	Serum { "SJ" / IH	oral	3	3	30–30
,,	1944	Fæces (frozen) / Fæces & urine (extr. dried) } IH	oral	3	2	20–22
,,	1944	Fæces and urine (extr. dried)—IH	oral	3	0	..

1. IH = Material from one or more cases of infective hepatitis.
SJ = ,, ,, icterogenic serum or one or more cases of serum jaundice.
"SJ" = Material collected in area endemic for infective hepatitis but actual case source was not determined.
2. sc = subcutaneous; ic = intracutaneous; im = intramuscular; iv = intravenous; in = intranasal and in most cases intrapharyngeal.
3. Only those cases in which clinical jaundice developed have been listed as positive.

filtered and dried by one of us (C. E. v. R.)—to three volunteers, two acquired jaundice at intervals of 20 and 22 days.

A third group of three men received the urine and stool extracts alone, and no case of jaundice resulted.

In the course of these same experiments a pool of icterogenic serum from cases of questionable serum jaundice (see table) was inoculated intracutaneously into five volunteers, and it gave rise to frank hepatitis in three with the usual long incubation periods of from 56 to 70 days. This same serum pool failed to induce the disease when fed to three volunteers.

CONCLUSION

The sum total of these latest results indicates, so far, that in cases of infective hepatitis the virus or icterogenic agent is *in the fæces*, and that the disease can be produced in man by feeding such material in capsules or by spraying it into his nasal and pharyngeal passages. Similarly the disease can be produced by feeding *serum* from cases of infective hepatitis. In these feeding cases, both in the series reported by MacCallum and Bradley (1944) and those in the series by Havens et al. (1944), the incubation periods have on the average been about 28 days, being shorter than the incubation periods of typical serum jaundice.

From these experiments one main feature becomes apparent: there is justification for suspecting that the intestinal-oral circuit is part at least of the natural route of spreading infective hepatitis. Others have already indicated that their practical experience with epidemics of infective hepatitis among British and American troops in the Middle East is in keeping with this idea.

REFERENCES

Cameron, J. D. S. (1943) *Quart. J. Med.* **12**, 139.
Findlay, G. M., Martin, N. H. (1943) *Lancet*, i, 678.
— — and Mitchell, J. B. (1944) *Ibid*, ii, 301, 340, and 365.
Havens, W. P., Jun., Ward, R., Drill, V. A., Paul, J. R. (1944) *Proc. Soc. exp. Biol. Med.* **56**, 206. Also other unpublished experiments.
MacCallum, F. O., Bauer, D. J. (1944) *Lancet*, i, 622.
— — and Bradley, W. H. (1944) *Ibid*, ii, 228.
Oliphant, J. W., Gilliam, A. G., Larson, C. L. (1943) *US Publ. Hlth Rep.* **58**, 1233.
Paul, J. R., Havens, W. P., Jun., Sabin, A. B., Philip, C. B. Transmission Experiments in Infectious Hepatitis. Presented at the AMA meeting, Chicago, Ill., June 16, 1944 (to be published in *J. Amer. med. Ass.*).
Stokes, J. Discussion of paper by Paul, Havens et al. (to be published in *J. Amer. med. Ass.*).
Voegt, H. (1942) *Münch. med. Wschr.* **89**, 76. Abstr. from *Bull Hyg.* (1942) **17**, 331.

PENICILLIN BY MOUTH[1]

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DURING routine examination of the penicillin sensitivity of organisms isolated from patients undergoing or about to undergo treatment, using mainly the "gutter plate" method, we found that it was not always convenient to employ penicillin solution for making up the medium filling the gutter, and we tried with success the Seitz-filtered urine of patients receiving parenteral penicillin. Such urine was observed to retain its activity longer than saline solutions of the sodium salt of equal inhibitory power, and it therefore seemed probable that the substance excreted in the urine had been to some extent stabilised by passage through the body.

Among the chemical properties attributed to penicillin are: (i) it is stable as a salt between pH 5 and pH 7; and (ii) it is destroyed by acids and alkalis and by heat.

To ascertain whether sensitivity to pH and to heat was measurably altered in the passage of penicillin through the body the following experiment was undertaken:

> The urines of 25 patients receiving intramuscular injections were diluted to contain approximately 25 units per c.cm. A control solution of 25 units per c.cm. of penicillin in saline was prepared. Urines and control were now divided into aliquot portions, and reactions were adjusted so as to give within each set of portions a range of pH from 2 to 10. All were allowed to stand at room temperature for 3 hours, after which they were titred. They were then autoclaved at 15 lb. pressure for 15 min. The slight change in pH after autoclaving was now readjusted to the original level, and the samples were again titred.

The results (fig. 1) showed that the antibacterial substance in the urine was appreciably more resistant to changes in pH and to heat than was the original penicillin solution. It stood up well to a reaction of pH 2·2 and was only partially affected by autoclaving. Sodium penicillin mixed with normal urine behaved in the same way as a saline solution. The effects of boiling, as judged by titration of inhibitory power, are not in all

1. This paper has been much abridged. To prevent delay in publication no proof has been sent to the authors.—ED. L.

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TABLE I—PENICILLIN ACTIVITY (RECORDED IN ZONE DIAMETERS) IN VARIOUS MIXTURES FOLLOWING pH CHANGES

Solutions	pH	Incubated 3 hr.						Incubated 6 hr.						pH			Incubated ½ hr.					
		Undiluted		1:20		1:100		Undiluted		1:20		1:100					Undiluted		1:20		1:100	
		C	F	C	F	C	F	C	F	C	F	C	F				C	F	C	F	C	F
Egg	7·25	38	44	27	37	18	24	23	35	15	28	13	20	2·44	All solutions incubated 1 hr. and readjusted to pH shown in braced column	6·99	21	31	11	19	11	19
Taurocholate	7·31	38	44	22	36	19	25	22	33	20	27	11	20	2·31		6·99	20	30	11	19	—	—
Milk	7·33	34	41	27	32	16	24	26	33	22	27	14	21	2·5		7·99	20	26	—	—	—	—
Plasma ..	7·15	28	38	nd	nd	nd	nd	24	32	nd	nd	nd	nd	2·7		7·15	12	22	—	—	—	—
Cholesterol ..	7·50	38	44	26	30	15	19	27	35	20	28	14	22	2·44		7·99	—	—	—	—	—	—
N/saline ..	7·33	32	40	20	32	15	27	24	34	22	30	15	22	2·44		7·8	—	—	—	—	—	—
Distilled water	7·67	31	37	22	29	15	20	24	35	16	32	16	20	2·44		7·99	—	—	—	—	—	—

All undiluted solutions contained 100 units per c.cm. C=Oxford assay cylinder. F=Filter-paper disc. —=No inhibition. nd=not done.

respects the same as those of autoclaving, and are not included in fig. 1.

It occurred to us therefore that it might be possible to stabilise penicillin outside the body, so that it could be given by mouth.

PAST INVESTIGATIONS

Administration of penicillin by mouth has been generally considered unsuitable because of destruction by the gastric juices.

Activity was reported as present in both blood and urine after introduction of penicillin into the intestine of the rat (Chain et al. 1940). Florey and his collaborators (Abraham et al. 1941), using the duodenal route, found that penicillin could be detected in the blood of the cat but not the rabbit. Antibacterial concentration persisted considerably longer after intestinal than after either intravenous or subcutaneous administration; and in both cats and rabbits penicillin was found in the bile. In experiments on man, they introduced 16,000 units by duodenal tube—twice the dose they had up to then given by vein—and again found that the inhibitory level of the blood persisted longer and was steadier than after intravenous administration. When they gave penicillin with alkali by mouth to a patient with urinary infection (*Staph. aureus*) the infection disappeared, this being attributed wholly to the amount excreted in the urine. Tests of the blood for bacteriostasis are not recorded.

These workers suggested trial by mouth with the addition of substances which would raise the pH of the gastric contents, but thought it possible that this route would always require larger dosage than was needed by injection. Florey and Florey (1943) reported the treatment of one patient with penicillin enclosed in 'Salol'-coated capsules, and of a second to whom it was given by duodenal tube; but there was little if any improvement in either. We have been unable to find other relevant references.

TABLE II—ZONES OF INHIBITION IN URINE OF S/SGT. D (HYPERCHLORHYDRIA) AFTER 15,000 UNITS OF PENICILLIN BY MOUTH IN VARIOUS SOLUTIONS

Time (hr.)	Saline			Plasma			Taurocholate plus cholesterol			Taurocholate (50,000 units)			Saline after sod. bicarb.			Egg after sod. bicarb.		
	vol. (c.cm.)	C	F	vol. (c.cm.)	C	F	vol. (c.cm.)	C	F	vol. (c.cm.)	C	F	vol. (c.cm.)	C	F	vol. (c.cm.)	C	F
1	70	—	—	136	17	36	86	10	17	126	17	26	92	17	27	80	20	30
2	51	—	—	41	—	—	30	12	20	24	13	21	55	18	29	73	21	31
3	73	—	—	76	—	—	40	—	—	32	—	—	82	18	30	42	20	31
4	67	—	—	50	—	—	72	—	—	30	—	—	52	17	27	66	19	28
5	44	—	—	56	—	—	38	—	—	52	—	—	37	—	—	58	19	27

C = Oxford cylinder. F = Filter-paper disc.

LABORATORY INVESTIGATIONS

In the experiments reported we used sodium penicillin of American manufacture. Several makes have been employed and have not differed in their behaviour to any appreciable extent. The calcium salt, which is more stable than sodium penicillin, is now on trial.

Having shown that penicillin is rendered less unstable in the body, we set out to find "stabilising agents" by which the drug could be made more suitable for oral administration. In choosing these we were largely guided by two factors. First, the fact that penicillin is excreted in appreciable quantities in the bile led us to try sodium taurocholate and cholesterol. Secondly we were influenced by the personal account of work done by Lieut.-Colonel R. J. V. Pulvertaft, formerly commanding our unit, who told us that he had rendered penicillin salts more resistant to heat, as judged by inhibitory power, by dissolving them in certain chemical mixtures, and that he suspected that the important element might be sulphur. As we had no suitable pure chemical substances, we decided to try milk and eggs.

TABLE III—AVERAGE BACTERIOSTATIC ACTIVITY OF SERUM OF PATIENTS AND VOLUNTEERS RECEIVING 20,000 UNITS OF PENICILLIN BY MOUTH IN VARIOUS DILUENTS

Time after dose (hr.)	No. tested	Dilution producing bacteriostasis		Time after dose (hr.)	No. tested	Dilution producing bacteriostasis	
		Complete	Partial			Complete	Partial
¼	3	—	1:1	1½	2	1:2	1:4
½	5	1:1	1:2	2	6	1:2	1:4
1	6	1:2	1:4	3	8	1:2	1:4

It was necessary first to know the range of activity for penicillin in saline at various pH levels. As fig. 1A shows, the maximum occurs between pH 4·6 and pH 8·0, although some inhibition can be demonstrated beyond those limits. The solutions were left at the test pH for 3 hours only, as being probably the longest time they might remain in the stomach. Our figures coincide with those given by Foster and Wilker (1943), who continued the test to 100 hours, finding little change up to 5 hours but an increasing narrowing of the range of activity from then onwards, approaching an optimum at pH 5·8. Penicillin dissolved in distilled water, serum, and milk, tested through the same range, gave much the same result.

We both now swallowed, 3 hours after breakfast, 15,000 units in saline, and found that penicillin could be detected in the urine passed half an hour later, with activity demonstrable in urine passed for some hours. The same dose, at the same relative time, taken by three members of the laboratory staff, gave the same results—with one important exception. By a happy chance for us (though not for him), this man, S/Sgt. D., showed no inhibition in the urine. That this was due to hyperacidity of the gastric juice was confirmed by an examination of stomach contents, which gave a reaction of pH 1·29 one hour after food, and by the fact that penicillin

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was excreted in the usual way after an intramuscular injection. Several other diluents and mixtures were given him and others by mouth and it was found that the more complex substances, such as milk and cholesterol, gave constantly better results than the simpler ones, such as water and broth.

In the following experiment our object was to expose penicillin, mixed with various diluents, to conditions somewhat resembling the changes in pH to be met in the stomach and then in the blood after absorption from stomach or intestine.

To equal volumes of each diluent penicillin was added (100 units per c.cm.) The solutions were adjusted to a pH of about 7·5 and were incubated for 6 hours at 37° C, during which time inhibition was twice measured. The pH was then lowered to the neighbourhood of 2·5 and they were again incubated for 1 hr., after which the reaction was readjusted to pH 7–8 and the incubation and titring were repeated.

Table I shows that all the solutions withstood the first incubation at around pH 7·5. When the pH was lowered to 2·5 the penicillin in the distilled water, saline and cholesterol solutions was destroyed; the penicillin in plasma and milk was seriously affected; and the least damage was suffered by the penicillin dissolved in raw egg. From this we conclude that some substance present in egg protects penicillin against an acid medium. Taurocholate also had some protective effect.

A dose of 50,000 units in taurocholate swallowed by S/Sgt. D. was followed by a small excretion in the urine; and one of 15,000 units in saline preceded by alkali gave a still more promising result. The most satisfactory excretion, however, was obtained when he was given alkali followed by penicillin mixed with raw egg (table II). Three other volunteers received this mixture, also with a leading dose of alkali, with uniformly successful findings. And finally the same dose of both alkali and egg-penicillin mixture was swallowed by a patient with achlorhydria, in order to test the risk of destroying activity by over-alkalisation. Excretion in this case was also normal.

Tests were now carried out to ascertain whether the concentration of penicillin in the serum of persons taking penicillin by mouth was as high as in those receiving it intramuscularly. It was found, both by plate and dilution methods, that 15–30 minutes after an intramuscular injection of 15,000 units the serum level rose sharply to 0·3–0·5 unit per c.cm.; but from that time it decreased until at 2–3 hours it became impossible to detect by plate methods, and in dilution tubes one could say no more than that the whole serum either completely or partly inhibited growth of the test organism (the Oxford *Staph. aureus*).

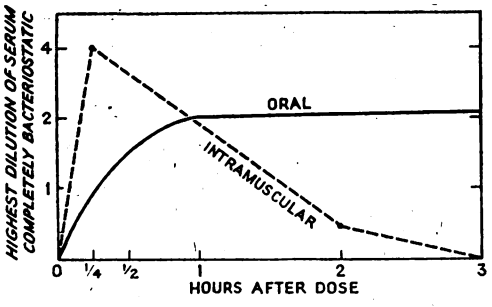

Fig. 2—Bacteriostatic activity of serum after oral administration and intramuscular injection of penicillin. The curve for oral administration is based on table II. The intramuscular dose was 15,000 units.

It was therefore desirable that some method of assay should be found by which small quantities of penicillin could be determined with fair accuracy, and we tried that devised by Hoogerheide (Foster and Woodruff 1943). This is probably the most accurate yet described for titring penicillin in simple solution, but with serum somewhat equivocal results were obtained, and possibly the technique may not prove so useful in the presence of protein. This observation may be related to the findings of Bigger (1944). For the estimation of small quantities in serum, the slide technique has been employed, and it has been found easier to perform this test by placing the coverslips directly on to the inside of the bottom of a petri dish.

Table III shows the bacteriostatic activity of the serum of volunteers and patients after taking 20,000 units of penicillin, in various mixtures, by mouth. Fig. 2 contrasts these findings with those obtained after intramuscular injection of 15,000 units.[2] When penicillin was taken by mouth the proportion excreted in the urine was generally found to be 75–80%, which is much the same as when it is administered parenterally; but, on the average, excretion continued for 5–6 hours after a single oral dose as against 4–5 hours after intramuscular injection. The method of assay was by the ordinary Oxford cup; but if a more refined one is used, minute traces of inhibitory substance can be detected for several hours longer.

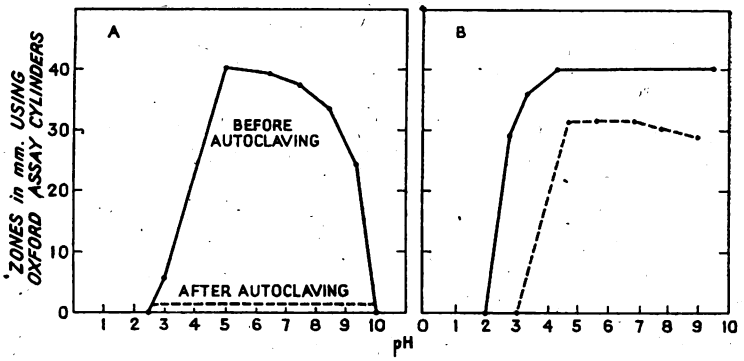

Fig. 1—Activity of penicillin (A) in saline solution (25 units per c.cm.), and (B) in patient's urine (approx. 25 units per c.cm.) at various pH, before and after autoclaving at 15 lb. for 15 min.

The method employed as a routine for titring relatively large quantities of penicillin was as follows. Dilutions of the fluid (1/5, 1/10, 1/15) were set up in Oxford assay cylinders and also were soaked in Chardin filter-paper cut in discs of 14 mm. diam. (Foster and Woodruff 1943). The two tests were always put up on the same plate, and the results compared, for occasionally one might give an obviously false reading, in which case it could be corrected by the other. The medium used was nutrient agar, and 0·1 c.cm. of a 12-hour peptone-broth culture of the Oxford staphylococcus was added to 100 c.cm. agar at 55° C before pouring the plates. In this way the streaking one may get with "spread" plates is avoided, and clear-cut results are always obtained.

For the most perfect zones it was found that the plates should be placed in the refrigerator for 3 hours before incubating at 37° C for 12 hours. When so treated, they are of course a little larger. A standard range of between 1 and 10 units of penicillin per c.cm. was also prepared, and the readings checked against the urine dilutions. For a more accurate reading, urine was diluted in the range of 0·3 to 0·7 unit per c.cm. and read by Hoogerheide's technique.

The laboratory investigations and the experimental doses given to volunteers during this work, extending over a period of 4 months, have required the use of no more than 1,220,000 units of penicillin.

CLINICAL TRIALS

We were now satisfied that penicillin could be given by mouth to patients with wide ranges of gastric pH and that a satisfactory bacteriostatic level would result in the blood. According to Garrod (1944) "a concentration giving complete inhibition in pure serum is probably adequate for full therapeutic effect."

The treatment was tried first on patients who would not suffer if it proved ineffective. The method of administration was as follows: a level teaspoonful of sodium bicarbonate, or of magnesium trisilicate, was swallowed with a quarter-pint of milk, and after an interval of 10 minutes the dose of penicillin was given, dissolved in 1 or 2 c.cm. saline and mixed with a raw egg. If this mixture was not thought palatable, it was further mixed with milk and sugar. Results in cases of tonsillitis appeared satisfactory, and the method is now

2. Since this paper was written many further serum estimations have been made. In these the average bacteriostatic activity of the serum after oral administration was somewhat higher up to 1 hour, and somewhat lower later, than that shown in fig. 2. In other words, in this larger series the oral curve was nearer the intramuscular.

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being tried in pneumonia, gonorrhœa, and surgical sepsis.

SUMMARY AND CONCLUSIONS

Experiments show that penicillin undergoes a "stabilising" change during passage through the body. It becomes more resistant to heat and to alterations of pH.

Admixture of penicillin with raw egg (and to a less extent with other substances tested) makes it more resistant to heat and alterations of pH. The change produced by mixing penicillin with egg may not be the same as the change produced by its passage through the body, but the resulting resistance is of the same kind.

When volunteers were given a dose of alkali followed by penicillin in egg, the bacteriostatic activity of their blood rose to satisfactory levels. Similar results were obtained in a volunteer with hyperchlorhydria and a patient with achlorhydria.

We wish to thank Colonel H. T. Findlay, DDP, MEF, who allowed us to use penicillin for this investigation, Lieut.-Colonel H. L. Wallace and Lieut.-Colonel R. Marnham for making available patients in the medical and surgical divisions of the hospital, and Lieut.-Colonel J. M. Basset for initiating treatment in his department. Major N. F. Coghill has given us much helpful criticism and advice, and we are especially indebted to Sgt. J. M. Wilson, RAMC, who has carried out a large part of the technical work.

REFERENCES

Abraham, E. P., Chain, E., Fletcher, C. M., Florey, H. W., Gardner, A. D., Heatley, N. G., Jennings, M. A. (1941) *Lancet*, ii, 177.
Bigger, J. W. (1944) *Ibid*, ii, 142.
Chain, E., Florey, H. W., Gardner, A. D., Heatley, N. G., Jennings, M. A., Orr-Ewing, J., Sanders, A. G. (1940) *Ibid*, ii, 226.
Florey, M. E., Florey, H. W. (1943) *Ibid*, ii, 387.
Foster, J. W., Wilker, B. L. (1943) *J. Bact.* **46**, 377.
— Woodruff, H. B. (1943) *Ibid*, p. 187.
Garrod, L. P. (1944) *Brit. med. J.* i, 528.

AMŒBIC DYSENTERY IN EASTERN INDIA

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DYSENTERY presents one of the greater problems which confront our armed forces in the tropics. In two years I saw some 2000 cases in Eastern India, both in forward areas and base hospitals, 1000 of them having amœbic dysentery. The diagnosis of amœbic dysentery was not made unless *Entamœba histolytica* was found in the stools or typical ulcers were demonstrated in the gut, apart from a few cases of hepatic amœbiasis. Bacillary dysentery was diagnosed on the presence of the typical "bacillary exudate" in the stools (Anderson 1921, Haughwort 1924) and by sigmoidoscopy. Shortage of equipment precluded the use of cultures for diagnosis on any large scale. Cases in which the stools showed an indefinite exudate, and in which amœbiasis could not be demonstrated, are grouped under the diagnosis "clinical dysentery." Some of these were cases of healing bacillary dysentery and others of amœbiasis without or with very scanty protozoa in the stools. The proportions of the types of dysentery are given in table I.

TABLE I—TYPES OF DYSENTERY

Source of cases	Diagnostic procedure	No.	Bacillary dysentery	Amœbic dysentery	Clinical dysentery
Consecutive cases passing through CCS	One stool exam. Case evacuated to base hospital	149	27 (*18%*)	47 (*31·5%*)	75 (*50%*)
Base hospital	Stool exams. with sigmoidoscopy in few cases	380	136 (*36%*)	193† (*51%*)	51 (*13%*)
Base hospital	Sigmoidoscopy and stool exams.	500*	163 (*33%*)	282‡ (*56%*)	55 (*11%*)

* A few of these have been included in the second group.
† Includes 27 double infections. ‡ Includes 38 double infections.

The relative importance of the amœbic and bacillary forms is shown by the following facts: (*a*) Amœbiasis was 1½ times as common as bacillary dysentery. (*b*) The stay in hospital in cases of amœbiasis varied from a minimum of 3 weeks up to several months, usually 28 days in uncomplicated cases, whereas in bacillary dysentery the stay was 7–14 days, usually 8 days, with very rare cases requiring long periods. (*c*) The time lost from dysentery in one unit over a period of 8 months (table II) averaged 27 days in cases infected with *E. histolytica* and 2–3 days in cases not so infected. (*d*) The mortality from amœbiasis was 0·8%, whereas no death occurred from bacillary dysentery in nearly 700 cases.

TABLE II—TIME LOST FROM DYSENTERY BY 95 MEN IN 8 MONTHS

Amœbic* infection	No.	Days off duty		
		From amœbic dysentery	Bacillary dysentery and diarrhœa	Average
Infected with *E. histolytica* ..	21	491	70½	26·8
Not infected ..	74	..	168½	2·28

* Based on the results of two stool examinations from each man, after 8 months in India.

EPIDEMIOLOGY

Both conditions appeared to be mainly fly-borne, though in amœbic dysentery relapses and the variable incubation period spread the admissions more evenly over the year. For example, in a medical unit an attempt was made to dispose of dysenteric fæces by incineration at the beginning of the monsoon. Owing to the use of wet fuel and an unsuitable "bee-hive" type of incinerator the attempt was ineffective and large numbers of flies bred in the fæcal matter running from the incinerator and invaded the cookhouse 100 yards away; 7 cases of amœbic dysentery occurred among 100 men 4–6 weeks after this disaster.

Amœbic dysentery is said to be a water-borne disease. No epidemiological confirmation of this was obtained. However, in this connexion it is worth mentioning the findings of Yorke and Adams (1926), that chlorination and potassium permanganate in the strength generally used do not kill amœbic cysts in water.

CLINICAL FINDINGS

All grades of severity were seen, from the very acute with extensive ulceration, 20–30 stools daily, fever and prostration, to the mildest of diarrhœas with traces of mucus showing occasional vegetative forms, and the man without symptoms in whose fæces the cysts of *E. histolytica* were found. The most common type began with diarrhœa, 5–6 stools daily for 3–6 days, then becoming more severe with blood and mucus in 8–12 stools daily, associated with malaise, anorexia, slight fever, abdominal colic, and a varying degree of tenesmus. But such are the variations in symptoms that the clinical picture is not sufficient to establish the diagnosis, and a detailed account of the various types seems superfluous. Three syndromes only will be described.

1. *Extensive amœbic ulceration without diarrhœa or obvious blood or mucus in the stools.*

Private A, aged 23, with a week's history of headache, abdominal pain and vomiting. Constipated, except for one loose motion on the day of admission. Shivering and sweating on evening of admission. Physical examination negative apart from furred tongue and tenderness in right abdomen. Stool examination showed no abnormality. Blood slide: malignant tertian parasites +++. Quinine gr. 30 daily. For 3 days progress was normal. Further stool examinations were negative except for a fleck of blood on one occasion. On 5th day patient was drowsy; intravenous quinine gr. 6 given twice. Slight pain in RIF on coughing. On 6th day severe abdominal pain of rapid onset with generalised distension. Tender in RIF. Liver dullness reduced. Congestion at both lung bases. Granular feeling of rectal mucosa and tenderness in rectovesical pouch. No blood or mucus on finger. General condition very poor. Enema given with good result including some blood and mucus. Condition rapidly deteriorated. Exploration considered unjustified. Death followed in a few hours.

Autopsy: General peritonitis with thick fibrinopurulent exudate in RIF. Cæcum greatly thickened, with perforation of anterior wall; interior showed massive confluent amœbic ulceration. Ascending colon: scattered amœbic ulcers, more

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extensive at hepatic flexure. Splenic flexure: greatly thickened mass size of cricket ball, inside which was a great ragged ulcer 3 inches in diameter. Descending colon: a few isolated ulcers. Sigmoid colon: many large discrete oval ulcers. Spleen enlarged, very soft, dark red. Gross œdema both lungs.

Cause of death: Toxæmia due to peritonitis following perforation of an amœbic ulcer of the cæcum. Contributed to by recent MT malarial infection.

2. *Amœbic typhlitis closely mimicking appendicitis.*—The high carrier-rate, which seems to be about 20% in British troops, and information about cases returned to this country suggests that amœbic typhlitis may become an important differential diagnosis of appendicitis in England. In about 50 cases dysentery was not present clinically and the presenting symptom was pain in the right iliac fossa. It is on these cases that the following description is based.

The presenting complaint is pain in the RIF, which may be either colicky or continuous. The duration may have been weeks or days with a history of previous attacks. It sometimes comes on after meals, presumably because of the gastrocolic reflex. As a rule it is not severe, but in a few cases it is acute. Vomiting is not rare. There is often general abdominal malaise, and sometimes pain in the LIF and right hypochondrium. There may or may not be diarrhœa, with or without blood or mucus. The most difficult cases are those in which the stools are formed and without mucus. Headache is fairly common. There may be no history of dysentery or diarrhœa, but there will be a history of service in the tropics or subtropics. The temperature may be raised to 99°–100° F but is often normal. The pulse corresponds with the temperature.

Examination shows a furred tongue. There may be evidence of loss of weight, but the condition is compatible with obesity. The abdomen is not distended, though slight prominence may be detected in the RIF. There is tenderness, often guarding and sometimes rigidity in the RIF, which may be greatest over McBurney's point, but more usually is a little higher up. Occasionally it is worst low in the RIF, from involvement of the sigmoid. The cæcum is often palpably thickened; this is a valuable sign. Thickening may be found and tenderness elicited over the descending colon in the LIF. Tenderness of the liver is present in half the cases and is greatly in favour of amœbiasis. Rovsing's sign, hyperæsthesia, and a reduced or absent abdominal reflex may all be found but are inconstant.

Rectal examination may elicit tenderness on the right side high up. There is sometimes a "velvety" feel to the finger. The mucosa is often folded redundantly. There may be blood or mucus on the withdrawn finger. Examination of a stool or the result of an enema may reveal blood and mucus and amœbæ, but in a third of the cases it will be negative at the first examination. It is well to remember that a soap enema, especially if given too hot or too cold, may produce mucus from a normal bowel. Normal saline is less irritating and should be given at 100° F. The white-cell count usually shows an increase to 10,000–14,000, average 12,000, but the polymorphs are not increased relatively to the other cells, amounting to 65–75% of the total. If hepatitis is present the total count may be higher (18,000), though it may be normal and the polymorphs may retain their normal percentage. This is a valuable diagnostic point. Sigmoidoscopy will show typical lesions in about 50%.

More severe forms occur with peritoneal inflammation, perforation, and local abscess formation or general peritonitis. In these the diagnosis may be very difficult.

Two cases of amœbic typhlitis were opened under the impression that these were appendicitis. There was a plastic peritonitis in both cases, but no perforation. The abdomen was closed without drainage and recovery was uninterrupted on emetine therapy. The appendix was not removed.

Amœbic appendicitis is described in the textbooks, but I have not seen a proven case. It may complicate typhlitis, but in no case has removal of the appendix been indicated after emetine.

3. *Amœbiasis causing dyspeptic symptoms.*—This occurs in chronic cases. There is pain in the epigastrium or right hypochondrium ½–2 hours after meals. Sometimes it is continuous and worse on exertion, or it may be in the back or shoulder simulating fibrositis. There may be nausea. Stools may be normal but more usually there is constipation alternating with diarrhœa. Examination may elicit thickening of the cæcum and hepatic tenderness. The symptoms disappear rapidly under emetine treatment. They may be due to mild amœbic hepatitis or a reflex spasm of the pylorus from disease of the cæcum. Manson-Bahr (1939) has commented on the frequency with which duodenal ulceration follows amœbiasis. Weselmann (1942) has recovered vegetative amœbæ from the duodenum, so duodenal amœbic ulceration may be present in some cases of dyspepsia. The therapeutic test of gr. 4 of emetine in 4 days is useful.

COMPLICATIONS

Among 1000 cases of amœbiasis the complications encountered were as follows:—

Complication	%
Mild amœbic hepatitis	50
Acute „ „	3·9
Hepatic abscess	2·8
Hæmorrhage (severe)	0·2
Local peritonitis (no perforation)	1·0
Perforation { with general peritonitis	0·6
Perforation { with abscess formation	0·2
Rectal granuloma	0·2

Hepatitis was so common that it came to be considered part of the disease. Usually it was mild—discomfort in the right hypochondrium and over the lower ribs and back, with tenderness and slight hepatic enlargement. Whether these symptoms are due to bacterial "showers" from the ulcerated gut, as some believe (Acton and Knowles 1928), or to amœbic emboli, they responded immediately to emetine. The more severe forms were distinctly rarer and graded imperceptibly into hepatic abscess. They did not respond as quickly to emetine and tended to recur. I came to regard these as cases of miliary abscesses which would go on to true abscess formation if untreated. Amœbic hepatitis without diarrhœa and with negative stools occurred in 8 cases.

Of the 28 cases of hepatic abscess, 20 were Indians, which is an unusually high proportion (Napier 1943). Out of 700 British troops with amœbiasis, 8 developed liver abscess (1·1%). Out of 300 Indians with amœbiasis, 20 developed liver abscess (6·6%). There was one death, in an Indian whose abscess was secondarily infected with *Staphylococcus aureus*. Repeated aspiration, with emetine and sulphathiazole, was followed by drainage. The patient gradually wasted and died 10 days after operation. Autopsy revealed three large abscesses, only two of which had been reached at operation. Of the remaining 27, 3 were aspirated, and all the rest made good recoveries on emetine alone. The maximum dose given was gr. 60 in 120 days; the average was gr. 36 in 108 days.

Minor hæmorrhages were not uncommon. Severe hæmorrhage occurred twice, once in association with perforation, followed by death. The other case recovered with emetine and blood-transfusion.

Local peritonitis without perforation was recognised 10 times. Two cases were explored as already mentioned. All cases recovered.

Perforation occurred 7 times in the cæcum and once in the descending colon. General peritonitis followed in 6 cases, all fatal. In these the gut was gangrenous and too friable for effective closure. If the patient's condition allows, mobilisation and exteriorisation of the gangrenous portion is suggested, but is likely to be very difficult. Two of these cases perforated during emetine treatment, one on the fourth, one on the sixth day. Two perforations resulted in abscess formation behind the ascending colon. Expectant treatment with emetine and sulphapyridine was given, but both cases had to be drained after 4 days. Both had secondary hæmorrhages, which in one proved fatal after a recurrence.

Amœbic granuloma of the rectum was seen in 2 cases at sigmoidoscopy as large cauliflower-like masses resembling carcinomata. Amœbæ were found in the stools, and treatment with emetine and eusol enemata, starting with 1 oz. to the pint and working up to 8 oz. to the pint, caused the complete disappearance of the masses in two months, leaving a raw area covered with granulations which gradually healed.

DIAGNOSIS

The diagnosis rests on finding the amœba in the stools. In a few cases, especially in hepatic amœbiasis, this

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cannot be done. The stools must be fresh and should be examined within ½ hour of passing. This greatly increases the number of positive results. A further increase is obtained by examining in the theatre material obtained by sigmoidoscopy.

The exudate in amœbic dysentery is not characteristic. An indefinite exudate with necrotic pus cells and degenerated red corpuscles is seen in healing bacillary dysentery. The exudate in amœbic dysentery is usually less cellular with much necrotic cell residue, but may be highly cellular with many intact pus cells. This is due to secondary infection of the ulcers, and can be distinguished from the true bacillary exudate by evidence of necrosis of many of the leucocytes, and the scarcity or absence of macrophages. Charcot-Leyden crystals are a guide, but not proof of amœbiasis. They are also found in non-specific ulcerative colitis and carcinoma coli.

By sigmoidoscopy combined with microscopy of fresh specimens an immediate diagnosis can be made in 80% of all cases. In the remainder further stool examinations are necessary. With patience and care sigmoidoscopy is safe and almost painless except for the last 3 inches, which are nearly always uncomfortable. Proctoscopy if done gently is painless and perfectly safe and is of more value than is generally realised, since 50% of cases show lesions in the rectal ampulla. There were no ill effects in the present series from sigmoidoscopy or proctoscopy. The sigmoidoscopic diagnoses are shown in table III.

TABLE III—RESULTS OF 500 SIGMOIDOSCOPIES

Type of dysentery	Cases	Positive	Negative
Bacillary	163 (32·6%)	160 (98%)	3
Amœbic (final diagnosis) ..	282*(56·4%)	226 (80%)	56†
(1) Appearance diagnostic ..	—	155 (55%)	—
(2) Appearance not diagnostic; diagnosis by stool exam	—	71 (25%)	—
Clinical	55 (11%)	0	55
Total	500	386 (77·2%)	114

* Including 38 double infections. † Diagnosis by stool exam.

I prefer not to use premedication before sigmoidoscopy unless the patient is very nervous. Coöperation is more easily obtained if the patient is in full possession of his faculties and greatly assists a painless operation. If premedication is used, full doses should be given because small doses remove the patient's self-control without greatly reducing the discomfort. The knee-elbow position was used for preference.

TREATMENT

Treatment was largely dictated by the drugs available. When the earlier inevitable shortages were overcome the following routine was adopted.

Primary case: 10–12 daily injections of emetine gr. 1, the total given being gr. 1 per stone body-weight. The injections are divided into two groups of 6 with 3 days' rest between them, to diminish the toxic effects of cumulation. And starting on the first rest day 'Carbarsone' 0·25 g. b.d. by mouth for 10 days.

This achieved a clinical cure in 50%, though the great difficulty in assessing cure and in following-up makes this figure unreliable; I think it is too high. In 40% cysts were found within 3 weeks of stopping treatment. A further course of carbarsone appeared to clear most of these; 10% required further emetine or EBI and chiniofon enemata; 2% were resistant to all treatment, from their first attack, vegetative amœbæ persisting, though there was nearly always symptomatic improvement.

Cysts will seldom reappear in the fæces until 10–20 days after treatment. Negative stools in the first 10 days prove nothing as regards eventual cure.

Relapses: The same procedure was adopted, subject to the amount of emetine already given. If three courses had been given it was felt that a further course would be unlikely to cure, so 6 injections of emetine were given if necessary to control acute symptoms, and the patient sent to special centres for the "combined treatment" (Manson-Bahr 1939)—EBI gr. 3 daily for 10 days, with chiniofon retention enemata 2½% 200 c.cm. daily for 10 days. If this had already been tried without success, invaliding was recommended and the symptoms controlled by further emetine or EBI and chiniofon.

Relapses tend to become more frequent and more resistant to treatment the longer the infection has been present. More thorough treatment of the initial attack, including the combined treatment, might reduce the number of chronic resistant cases which are distressing to see and futile to treat, though some resistant cases have been seen in which the first attack was thoroughly treated (Major Ball, personal communication).

Recently I have made a practice of giving a 4-day course of sulphapyridine 1 g. 4-hourly, or sulphaguanidine 3½ g. 4-hourly to all cases. It was of great value in allaying symptoms, even in emetine-resistant cases, and especially in those which showed a rich cellular exudate with many pus cells, though the amœba did not seem to be affected. It is too early to say whether it affected the response to emetine.

Various other drugs were tried—kurchi bismuth iodide, 'Enterosol' (4-3 iodoxy-quinoline), 'Amœbiarsan' (similar to carbarsone), 'Stovarsol,' retention enemata of eusol, silver nitrate, and 'Argyrol.' Kurchi seemed to be of little value. All the others were evidently active, but seemed inferior to the treatment described above.

TOXIC EFFECTS

Myocardial damage from excessive doses of emetine is by no means rare (Chopra and Sen 1934), and may be missed if the pulse is not examined after suitable exercise. Response to the erect position alone may be dramatic. In one patient, who was not acutely ill, the resting pulse-rate before treatment was 65–70; after gr. 34 of emetine it was 80–85; on standing up the rate rose to 160 immediately and gradually settled to 100 per min. on continuing to stand for 5 minutes. This was associated with cyanosis, breathlessness, and faintness. Personal idiosyncrasy is probably important. After 6 injections of emetine the resting pulse-rate of one patient had risen from 70 to 90. This myocardial damage is more common in relapsed cases who have had previous courses. A 3 weeks' gap should be left between courses and even then cases occur. A falling blood-pressure is an early sign. Mild cases clear in 4–6 weeks, but in a few symptoms were still present after 6 months. It does not appear to be generally realised that EBI can contribute to the cardiac damage, though it is less liable to do so than emetine.

Diarrhœa towards the end of a course of both emetine and EBI is not uncommon and must not be interpreted as a relapse of dysentery; it is a toxic effect of emetine and further emetine will aggravate it. I saw no case of neuritis.

DIET

It was often impossible to arrange for the diet recommended in the textbooks, especially in forward areas. Fortunately diet seemed to make very little difference. My final conclusion was that maintenance of good nutrition and attention to the vitamin intake, especially the B group, was more important than the need for a low-residue diet. Provided "pips and skins," coarse vegetables, spices, and alcohol were avoided, further restrictions seemed of little value.

RESULTS

The results can only be estimated, since the majority of cases could not be followed up, and the assessment of cure is uncertain.

Results	*Cases (%)*
Clinical cure	33
Improved with occasional relapses (some of these would be reinfections)	33
Frequent relapses	28·2
Resistant cases	5·0
Death	0·8

All will agree that these are very disappointing figures. As already urged by Leishman and Kelsall (1944), there is grave need for new and more efficient drugs in the treatment of this disease.

SUMMARY

Of 2000 cases of dysentery of all types seen in Eastern India in 2 years, 1000 were amœbic. Amœbic dysentery is a much longer and graver disease than bacillary dysentery in that area.

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Examples are given of extensive amœbic ulceration without diarrhœa or obvious blood in the stools; of amœbic typhlitis closely resembling appendicitis; and of dyspepsia arising from amœbiasis.

Hepatitis was present in over half the cases of amœbic dysentery, and liver abscess in 2·8%.

The finding of amœbæ in the stools is facilitated by examining a stool within ½ hour of its being passed, and by examining in the theatre material obtained by sigmoidoscopy; by these means an immediate diagnosis can be made in 80% of cases.

Injections of emetine, plus carbarsone by mouth, produced clinical cure in about half the cases of amœbic dysentery.

The sulphonamide drugs exert a favourable clinical effect, but do not eliminate the amœba.

Inadequate treatment of the initial attack predisposes to the resistant form of the disease.

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REFERENCES

Acton, H. W., Knowles, R. (1928) The Dysenteries of India, Calcutta.
Anderson, J. (1921) *Lancet*, ii, 998.
Chopra, R. N., Sen, B. (1934) *Ind. med. Gaz.* 69, 262.
Haughwort, F. G. (1924) *Bull. Inst. med. Res. Fed. Malay St.* no. 3.
Leishman, A. W. D., Kelsall, A. R. (1944) *Lancet*, ii, 231.
Manson-Bahr, P. H. (1939) Dysenteric Disorders, London.
Napier, L. E. (1943) Principles and Practice of Tropical Medicine, Calcutta.
Weselmann, H. (1942) *Dtsch. trop. Z.* 46, 457.
Yorke, W., Adams, A. R. D. (1926) *Ann. trop. Med. Parasit.* 20, 317.

RETURN OF THE BLOOD TO THE HEART

A CRITICISM OF THE ORTHODOX VIEW

FF. ROBERTS, M D CAMB.

TWICE recently THE LANCET has drawn attention to the mechanism of the return of blood to the heart. An annotation of Dec. 11, 1943, read:

> "It has long been taken for granted that during muscular exercise the veins must be subjected to a pumping action by the muscles which, in virtue of the valves in the veins, are able to augment the inflow of blood to the right auricle."

Only six weeks later (Jan. 22, 1944) appeared a leading article on the same theme with its bearing on pathological conditions. The juxtaposition of these references shows how fundamental is the problem and how much still remains to be learnt about it.

Orthodox teaching on the subject may be gathered from the following extracts taken from standard textbooks.

> "In exercise the return of blood is facilitated by muscular movement itself, which compresses the capillaries in the muscle itself and also to some extent the valved veins."
>
> "During muscular contraction, blood is squeezed out of the muscles and is forced towards the heart. When the muscles relax, blood is free to enter only from the arterial side, because reflux through the veins is prevented by their valves."
>
> "Every muscle, as we have seen, acts as an accessory heart, the muscular contractions emptying the capillaries into the veins and in the latter driving on the fluid towards the heart in virtue of the valves present in these vessels."

But it is not only in exercise that the aid of the muscles has to be invoked. The effect of gravity presents the same problem.

> "In the feet the capillary pressure is normally prevented from attaining very high values, owing to the presence of valves in even the smallest veins, and to the occurrence of constant small muscular movements, which by forcing blood along the veins, enables them to act as a pump."
>
> "The pressure in the veins of the foot is but little higher than that in the veins of the hand (L. Hill). When a man assumes the upright position, the arteries of the leg and foot contract until, under the combined influence of the heart's contraction and gravity, the blood-supply to the capillaries is just adequate. The return of blood from the dependent parts cannot be ascribed entirely to the heart beat but is largely due to the contractions of the muscles of the limb, which press on all the deep and superficial veins, and in virtue of the valves force the blood contained therein past Poupart's ligament into the abdomen. This explains why it is so difficult to stand for any length of time without moving, and emphasises the need of moderate exercise for the maintenance of a normal circulation."

Yandell Henderson (1943) "cannot resist the impression" that Harvey recognised that vigorous contraction of the muscles propels blood along the veins. In point of fact Harvey did entertain this view very definitely. In the first Disquisition written in reply to John Riolan's *Enchiridium* he says:

> "... by the impulse of the blood which is forced with each stroke into every part of the second and third region, that which is contained in the pores or interstices is urged into the smaller veins, from which it passes into larger vessels, its motion assisted besides by the motion and pressure of circumjacent parts; for from every containing thing compressed and constringed, contained matters are forced out. And thus it is that by the motions of the muscles and extremities, the blood contained in the minor vessels is forced inwards and delivered into the larger trunks."—(Willis's translation, 1847, p. 97.)

and in *De Motu Cordis* he says:

> "... it is forced from the capillary veins into the smaller ramifications, and from these into the larger trunks by the motion of the extremities and the compression of the muscles generally."—(*Ibid*, p. 71.)

That Harvey should have held this belief is surprising in view of his firm adherence to the Aristotleian theory of the sovereignty of the heart.

> "It is absolutely necessary to conclude," he says, "that the blood in the animal body is impelled in a circle, and is in a state of ceaseless motion; that this is the act or function which the heart performs by means of its pulse; and that it is the sole and only end of the motion and contraction of the heart."—(*Ibid*, p. 68.)

The theory of the pumping action of the muscles is therefore as old as the discovery of the circulation. Yet in spite of its distinguished parentage, the great authority of those who have sponsored it, and its general acceptance at the present day, there appear to me to be many fallacies in the reasoning adduced in its support.

THE PRESSURE GRADIENT

A pump is defined as a machine for raising fluid from a low to a high pressure or level. Since, as is universally admitted, the pressure falls from arteries to capillaries and from capillaries to veins, the muscles cannot come within this definition. Nor can they exert any accelerating effect unless they actually suck blood from the arteries—a view which, so far as I know, has never been entertained. In our childhood we have all made channels in the sand and have attempted to push already running water along with our spades only to find to our disappointment that this has no effect. As the channel cannot pass on more water than it receives so the muscles cannot eject from the blood-vessels in and around them more than these receive from the arteries. The blood-flow is no greater than if the muscles remained passive.

THE EFFECT OF GRAVITY

The estimation of venous pressure under living conditions has led to the most discordant results (Eyster 1926), showing either that the venous pressure varies considerably in different individuals or that the methods themselves introduce some disturbing factor. The circulation must however be subject to the laws of gravity and hydrodynamics. In all the vessels of the feet in the erect attitude—whether arteries, capillaries, or veins—the hydrostatic pressure must be added to the pressure due to the heart-beat. If, as we learn above, the arteries contract when the subject stands this only reduces the quantity of blood reaching the feet; the pressure remains unaltered. The pressure in the veins must exceed the hydrostatic pressure due to the length of the limb, otherwise the blood would never return to

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the heart, and this would be equally true if the blood had to be pumped up by the muscles. Moreover, the statement made by more than one writer that muscular movements keep the venous pressure low is absurd.

It is interesting to note that where gravity operates in favour of the veins these are given an entirely different function, for according to one standard work:

> "The capillary pressure in the blood varies with the position in reference to the heart from 30 cm. to 4 cm. H_2O. The reason is that the veins collapse and restrict the flow. The capillary pressure is always maintained at a positive value."

This surely is an entirely novel function to ascribe to the veins, the prevention of a negative pressure in the capillaries. What is wrong with the straightforward view that the normal positive capillary pressure is due to the heart-beat?

THE VALVES OF THE VEINS

The valves in the veins are regarded as an integral part of the pumping mechanism, more particularly in overcoming the effect of gravity. Structurally they form the only feature which this mechanism possesses in common with a pump as we know it. To a pump a valve of some sort is essential, and if the muscles together with the veins form a pump the valves in the veins must work efficiently. But in some veins the valves are known to be incompetent. Furthermore, the statement, quoted above, that valves are present "in even the smallest veins" is anatomically incorrect. It is generally agreed that the flow along the veins is continuous. *Eppur si muove.* This being so the valves clearly cannot operate; for if they opened and closed, the stream would be intermittent. Moreover, in order to make the stream intermittent in the veins where the valves are chiefly to be found, the pumping strokes of the muscles drained by these veins would have to be synchronised.

The valves clearly have no such function. Harvey realised what many modern writers fail to realise, that the valves have nothing to do with gravity. Their true function has never been better expressed than in his words:

> ". . . the veins, in short, as they are the free and open conduits of the blood returning to the heart, so are they effectually prevented from serving as its channels of distribution, from the heart."

In other words they exist to ensure that blood entering a main channel from a tributary must move towards the heart.

TONIC CONTRACTION

But even allowing the possibility of a pumping action during exercise, how does this take place during rest? Henderson, to whom the muscles are "tonic booster pumps," is driven to the assumption that tonic contraction takes place by contraction of different groups of fibres in rotation. But as THE LANCET points out, this hypothesis was disproved by Denny-Brown (1929) and also over sixty years ago by Gaskell (1878) when he showed that the circulation was maintained after tonus had been abolished by curare.

A further argument used is that when muscular movement is absent or reduced to a minimum the circulation fails. Men, it is said, cannot stand still for a long period because of the resulting stagnation of blood in the veins. But men can stand up for several hours, and if they indulge in minor changes in position it is difficult to see how such small movements have a substantial pumping effect. Nor is there any evidence that such movements are the instinctive response to blood stagnation, for there are several other possible factors such as the pressure of the feet against the ground and fatigue in all the joints. Even granting that prolonged standing throws a strain on the circulation, prolonged sitting is the daily fate of a large proportion of the human race. Yet the hydrostatic pressure on sitting is only less than on standing by the length of the thigh, and is about 60 cm. H_2O.

Hill, Barnard and Soltau (1897) state that—

> "whilst the limb is maintained in a dependent and immobile posture, the veins slowly distend and the tension within them, revealed by the finger to be rising very considerably. Normally during the constant activity of limb and muscles the veins at no time exhibit such tension. Therefore it is by the constant compressive action of the skeletal muscles and the change of limb posture that the blood is returned from the veins in the extremities."

That the veins become engorged when a limb hangs down no-one will deny, but that they become less distended when the limb becomes active is a statement whose truth can be challenged. It certainly does not agree with my experience. Moreover, why is constant activity more "normal" to limbs than the resting position which, in a great many people, they occupy for far longer periods?

THE PUMPING EFFICIENCY OF THE MUSCLES

The volume of blood returning from each human leg at rest is about 0·5 litre per min. During exercise it is of course several times more. If this is, as we are told, "largely" due to muscular contraction the muscles perform a truly formidable task and must possess hydraulic efficiency of a high order. That they should possess it is even more remarkable since such pumping could only be a subsidiary function of muscle tissue. But as regards the superficial veins it is difficult to see any signs of efficiency, since these can only be compressed between the muscles and the skin, and the skin is a very yielding structure. As regards the vessels lying within and between the muscles it has to be assumed that the muscles form a kind of sponge (Raciborski 1841). But if this were the case it would follow logically that during prolonged contraction a muscle must become ischæmic.

To sum up: when one reflects that by an action whose mechanical efficiency is doubtful the muscles perform a secondary function of "pumping" from a high to a low pressure under circumstances which make the valves inoperative; and that it is necessary to postulate (1) the existence of valves where they are known to be absent, (2) small movements which have never been demonstrated, (3) a mechanism of tonic contraction which has been disproved, and (4) the inability of the human body to do what it clearly can do—when, I say, one reflects on these things, one may be forgiven for hesitation in accepting the theory.

VENOUS PRESSURE AND THE OUTPUT OF THE HEART

It is a corollary of the theory which we have been discussing that the increase in venous pressure thus produced causes an increase in the cardiac output. The full implication of this view is not fully realised. Except in so far as it responds to the higher centres, the heart is degraded into an almost passive organ whose function is merely to raise blood from a low to a high pressure in blind obedience to the requirements of the muscles as expressed by the ability of these muscles to supply it with blood. The heart in fact is little better than a donkey-engine. But even the faithful find it hard to hold this view consistently. One writer, after saying in the orthodox manner that "the output of the heart depends upon the venous inflow," later remarks that "increased efficiency of the heart causes a fall of venous pressure." The two statements are of course contradictory. Either venous pressure influences the heart or the heart influences venous pressure; they cannot both be true.

That the stroke-volume of the heart depends upon venous pressure is held to have been proved by Patterson, Piper, and Starling (1915) on the heart-lung preparation. This experiment is however open to serious objections. There is the absence of the restraining influence of the pericardium. Then there is the wide range of fluctuation artificially produced in the venous pressure.

Venous pressure mm. H_2O	*Output of heart c.cm. in 10 sec.*
95	86
145	140
55	33

It is to say the least doubtful whether such alteration in venous pressure measured at the entrance of the inferior cava into the heart can possibly occur under physiological conditions. In 1924 I demonstrated that the acceleration in the passage of blood which is said to be produced

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by muscular contraction could be imitated by making a short-circuit between the abdominal aorta and inferior vena cava. When this was done the arterial pressure of course fell considerably, but there was no appreciable rise in the pressure of blood entering the heart. This is only what was to be expected from our knowledge of the great distensibility of the veins.

THE BAINBRIDGE REFLEX

Bainbridge (1915) claimed to have proved that increase in venous pressure caused a reflex quickening of the heart, the afferent path being the vagus and the efferent path being mainly the vagus and also possibly the sympathetic. The grounds for this belief however are dubious, to say the least. The acceleration was produced by the intravenous injection of saline into the dog in amounts ranging between 10 and 80% of the blood-volume, and it only occurred when this substantial addition was made rapidly. For instance, when 100 c.cm. was injected within 20 sec., the venous pulse rose from 70 to 160 mm. H_2O and the pulse-rate from 80 to 100. This result was confirmed in the cat by Sassa and Miyazaki (1920) using the same method. Anrep and Segall (1926) also claimed to have confirmed it but it is difficult to reconcile this claim with their statement "that in several cases the Bainbridge reflex was observed with no rise in venous pressure," and with their conclusion that "it is premature to regard venous pressure as being responsible for the reflex." Moreover, DeGraff and Sands (1925) observed the effect in one-third of their experiments after section of both vagi. In view of the highly artificial conditions of Bainbridge's experiment, together with the doubt thrown upon his results by these later workers, it seems highly questionable whether this result proves that a corresponding mechanism comes into operation during exercise. Yet this belief, so poorly attested, finds an established place in modern teaching.

CONCLUSION

In view of the passages which I have quoted it is only fair to say that I myself (Roberts 1920) have echoed in the main the thesis which I here criticise. But that was a quarter of a century ago and the years have made me more sceptical.

It is peculiarly difficult to discuss this subject without arguing in a circle, perhaps because the subject concerns a circle and a moving circle at that. However this may be, the fact remains that at whatever point in the circle one begins, one must think of what is happening behind it as well as what is happening in front of it. There would be some force in the pumping argument if the muscles pumped from a sump of variable content like the oil sump of a motor-car. But obviously the muscles can only pump into the veins exactly as much as they receive directly from the arteries. The advocates of this theory appear to me to be considering only the forward effect of the pumping action upon the veins and right side of the heart, ignoring the fact that such forward effect must be accompanied by an exactly corresponding backward effect extending through the arteries to the left side of the heart.

The theory, it seems to me, rests on unproved hypotheses, leads to many inconsistencies, runs counter to the law of gravity and the laws of hydrodynamics, and creates more problems than it solves. One wonders whether, if the matter were thoroughly explored, a simpler explanation could not be found in the thesis that the heart is the sole motive force of the circulation, being capable unaided of driving the blood, through arteries, capillaries, and veins, back to itself whatever the needs of the body.

REFERENCES

Anrep, G., Segall, H. N. (1926) *J. Physiol.* **61**, 216.
Bainbridge, F. A. (1915) *Ibid*, **50**, 65.
DeGraff, A. C., Sands, J. (1925) *Amer. J. Physiol.* **74**, 415.
Denny-Brown, D. E. (1929) *Proc. roy. Soc.* **104B**, 252.
Eyster, J. A. E. (1926) *Physiol. Rev.* **6**, 281.
Gaskell, W. H. (1878) *J. Physiol.* **1**, 262.
Henderson, Y. (1943) *Medicine*, **22**, 223.
Hill, L., Barnard, H., Soltau, A. B. (1897) *J. Physiol.* **22**, xix.
Patterson, S. W., Piper, H., Starling, E. H. (1914) *Ibid*, **48**, 465.
Raciborski (1841) *Mém. Acad. Méd.* **9**, 447.
Roberts, Ff. (1920) A Synopsis of Physiology, London.
Sassa, K., Miyazaki, H. (1920) *J. Physiol.* **54**, 203.

PENICILLIN IN WEIL'S DISEASE

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AN airman, aged 35, was admitted to a RAF hospital complaining of sore throat, headache, and pains in the back and legs, of 3 days' duration. Temperature 100° F; pulse-rate 130 per minute. The conjunctiva was very hyperæmic and the throat injected. Swab of the throat gave a profuse growth of hæmolytic streptococci on culture. Total white-cell count was 18,000 per c.mm. (neutrophils 79%, eosinophils 1%, basophils nil, lymphocytes 17%, monocytes 3%).

During the next 2 days generalised muscular tenderness was very pronounced, and on the fifth day of illness he had an epistaxis, slight jaundice developed, and a few purpuric spots were noticed on his upper chest. BP was 120/70 mm. Hg, and the urine showed a heavy cloud of albumin, bile positive, with spun deposit of bile-stained granular casts, few polymorphs, and many red cells; culture was sterile. A tentative diagnosis of Weil's disease was made, and 5 c.cm. of his blood were inoculated intraperitoneally into a guinea-pig. Serum was also sent to the Wellcome Research Laboratory for agglutination reactions.

Over the next 4 days the jaundice became deeper, and the man's general condition deteriorated; he had persistent hiccup, and vomited bile-stained fluid frequently. The serum-bilirubin was 12·5 mg. per 100 c.cm., and the blood-urea rose to 320 mg. per 100 c.cm. Lumbar puncture revealed bile-stained fluid under normal pressure; cells 5 per c.mm., protein 40 mg. per 100 c.cm., globulin no increase, chlorides 760 mg. per 100 c.cm., gamboge no change, Lange no change, WR negative, and Van den Bergh gave an immediate direct positive reaction.

Treatment with *Leptospira icterohæmorrhagiæ* antiserum was given on his ninth day of illness, on the first day 20 c.cm. intravenously and on subsequent days 10 c.cm. intramuscularly. A total dose of 60 c.cm. of serum was given, but his condition was still serious, and at times he was delirious and incontinent.

Up to this time there was no conclusive proof that the case was one of Weil's disease, despite repeated dark-ground examination of the urine, but, on the fourteenth day of illness, the urine showed active leptospira, morphologically resembling *L. icterohæmorrhagiæ*. The guineapig, which had been inoculated with blood taken on the fifth day of illness, died 10 days after inoculation, autopsy showing well-marked jaundice and multiple hæmorrhages in the lungs. Leptospira were identified by dark-ground examination of the urine.

The diagnosis now being definitely established, it was decided to try a course of penicillin, and a slow intramuscular penicillin drip was put up on the fourteenth day of his illness. After 24 hours, during which he had received 120,000 units of sodium penicillin, no leptospira could be demonstrated by dark-ground illumination of the urine. By this time the following positive result of agglutination was received, representing serum taken on the fifth day of illness: 1/10 trace, 1/30 positive, 1/100 positive, 1/300 trace, further dilutions negative.

The patient gradually improved, and his convalescence was uneventful apart from a hypochromic microcytic anæmia (Hb. 9·5 g. per 100 c.cm., red cells 3,740,000 per c.cm.). The blood-urea returned to normal 10 days after penicillin treatment had been begun. The total amount of penicillin used was 800,000 units extending over 7 days.

To estimate the effect of penicillin on *L. icterohæmorrhagiæ*, two guineapigs were inoculated intraperitoneally with the urine containing the leptospira from the original dead animal, the presence of which was confirmed by dark-ground illumination; 6 days later one of the animals was given intramuscular penicillin, 3 c.cm. twice daily (500 units per c.cm.), for 4 days. On the tenth day the animal which had not been given the penicillin died, and autopsy revealed well-marked jaundice, hæmorrhages in the lungs, and leptospira in the urine, seen by dark-ground illumination; whereas the treated animal survived and showed no ill effects.

SUMMARY

A case of Weil's disease, of such severity that life was endangered, was treated with *Leptospira icterohæmorrhagiæ* antiserum and penicillin, and slowly recovered.

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Leptospira were found in the urine 3 days after serum treatment, but after 1 day on penicillin no leptospira could be found.

In experimental infection of two guineapigs with active *L. icterohæmorrhagiæ*, the one treated with penicillin survived, whereas the other died in 10 days showing typical post-mortem appearances of Weil's disease.

Preliminary Communications

TRANSMISSION OF INFECTIVE HEPATITIS BY FÆCES AND URINE

DURING the past eighteen months a number of attempts has been made to transmit infective hepatitis by fæces and urine fed to volunteers by mouth. Though the investigations are being still continued there appears to be sufficient evidence to warrant the following conclusions. The causal agent of infective hepatitis is present in both the fæces and urine of persons suffering from the disease, and (at any rate in the fæces) it is present in a filtrable form.

Of six experiments with fæces from different patients in the early stages of infective hepatitis, within the first five days of jaundice, three have been positive. In these three positive experiments, of eighteen volunteers given fæces emulsified in milk by mouth seven developed symptoms of infective hepatitis in from 17 to 28 days: six of the eighteen volunteers were given a Seitz filtrate of stools by mouth, and two were positive.

Of six volunteers given urine by mouth from a patient with infective hepatitis, who also provided a positive fæces, three became infected.

While there is much epidemiological evidence to suggest that intranasal transmission through infected droplets is one method of infection, the excretion of the agent of infective hepatitis in the fæces and possibly urine shows that contamination of food and water and transference by flies may offer a more plausible explanation for the fulminating outbreaks occasionally encountered among both civil and military populations.

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Reviews of Books

An Introduction to Physical Methods of Treatment in Psychiatry

WILLIAM SARGANT, MB CAMB., MRCP, DPM, deputy clinical director, Sutton Emergency Hospital; ELIOT SLATER, MD CAMB., MRCP, DPM, clinical director, South Eastern Hospital. (Livingstone. Pp. 171. 8*s*. 6*d*.)

IN spite of the widespread adoption of physical methods of treatment in psychiatry since Wagner-Jauregg's great discovery, there has not been available to the psychiatrist any practical vade-mecum detailing the indications and technique of all these procedures. The want is met by this "introduction," which, without the usual apparatus of references and quotations, gives what in the authors' experience are the right lines on which physical treatment should be carried out. The book is frankly didactic.

Those whose memories extend to earlier decades may feel some concern lest new methods, however skilfully applied, may be too freely recommended. On the use of prefrontal leucotomy the authors quote the findings of Freeman and Watts, Hutton and Fleming, that two-fifths of the schizophrenics treated showed good results; also two-thirds of the depressives and four-fifths of the obsessional neurotics. They add that the number of obsessionals treated is small, and the results though encouraging must therefore be taken with caution.

> "A good result obtained by leucotomy in a severe chronic obsessional is likely to be permanent, there can be no guarantee of non-relapse after the insulin treatment of schizophrenia, the convulsion treatment of depression, and still less after the psychological treatment of the neurotic."

This statement, which is unbacked by statistics, seems to depend on the fact that leucotomy produces an irreversible change by permanently damaging the brain. The changes in the patient's behaviour, they admit, depend on the extent of the damage done, and include with good effects some which are less endearing. The temper may be more hasty, and there is less sense of its social consequences; the patient may become more exacting and imperative, less capable of sympathy with others, and lacking in self-criticism, though willing enough to criticise his environment. Furthermore there may be damage to the personality where its good qualities have depended on obsessional drive and persistence. The authors point out that the skill of the psychiatrist is required to ensure that the operation is not done on patients where these undesirable effects—to be expected in some degree in all patients—will have serious consequences.

More detail of the indications and the contra-indications of the physical methods so excellently described would have been welcome. The development of the physical treatment in psychiatry must depend on the growth of the psychological aspect: psychiatry is indivisible. As the book stands it is a *statement* of physical methods rather than an introduction to them, but it is a good statement. By its persuasive confidence in the efficacy of such treatment it will doubtless lead to a wider appreciation of the need for weighing up all the therapeutic resources before abandoning any psychiatric patient as a "hopeless chronic."

The authors have provided in an opening and a closing chapter a fair view of the wider framework within which the physical methods must have their place if they are not to be falsely aggrandised and misused.

Intracranial Arterial Aneurysms

WALTER E. DANDY, MD, FACS, adjunct professor of neurosurgery, Johns Hopkins Hospital, Baltimore. (Comstock Publishing Co. Pp. 147. $2.50.)

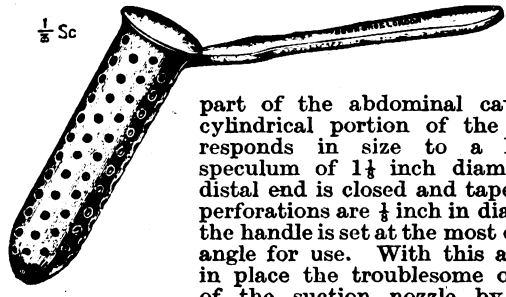
IN this thoroughly practical work on intracranial aneurysms Professor Dandy is not much interested in the nuances of the clinical pictures. This book, like others from his pen, is strongly individualistic: his forte is his courage and technical ingenuity in carotid ligations. He can now claim that his method of placing a silver clip on the carotid artery intracranially, just above the point where it pierces the dura, is a reasonably safe measure. He has done it thirty times and only once did hemiplegia result, and he believes this operation to be less dangerous than the tying of the internal carotid in the neck. A review of anomalies of the circle of Willis is illustrated by ingenious schematic drawings, but the information given in this chapter is more useful to explain disasters than to help the surgeon to prevent them. The author's respect for the dangers of angiography are in contrast to his unconventional attitude elsewhere.

The variable behaviour of intracranial aneurysms puts them among the most uncertain of surgical problems. Professor Dandy's account, though a milestone on the road, is not the final one.

New Inventions

FILTER FOR PERITONEAL SUCTION

THE peritoneal filter here illustrated is used, in conjunction with the standard Yankauer suction tube, to simplify the evacuation of free fluid from any part of the abdominal cavity. The cylindrical portion of the filter corresponds in size to a Ferguson's speculum of 1½ inch diameter. The distal end is closed and tapered. The perforations are ⅛ inch in diameter and the handle is set at the most convenient angle for use. With this attachment in place the troublesome obstruction of the suction nozzle by bowel is avoided, and any handling of the intestines becomes unnecessary, thus making for safety and saving of time. It is made for me by Messrs. Down Bros., Ltd.



NORMAN FLOWER, BM OXFD

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THE LANCET

LONDON: SATURDAY, FEBRUARY 17, 1945

Ætiology of Infective Hepatitis

IN 1915 a considerable proportion of sickness in the Mediterranean Expeditionary Force was caused by a form of epidemic jaundice clinically identifiable with the condition now called "infective hepatitis." Much attention was given to the disease by hygienists, clinicians, and bacteriologists, and though its ætiology remained obscure they agreed that it was a product of the insanitary conditions associated with the campaign. It was in fact generally attributed to a specific infection introduced via the alimentary tract and mainly spread through human excreta. Moreover, a close association in incidence with dysentery was noted, and its prevalence in forward areas and base camps heavily infested with flies suggested transmission from fæces by these vectors. A paper by Lieut.-Colonel RAYMOND KIRK published in our issue of Jan. 20 shows that similar conclusions have been drawn in the Middle East during the present war. His account of the hordes of flies at Alamein which "swarmed over everything," and presumably conveyed the infection to men who were unable to protect their food, mess-tins, mouths, and hands, is all too reminiscent of conditions in the Eastern Mediterranean thirty years ago.

One reason why the causation of infective hepatitis has not been cleared up sooner is that animals generally are not susceptible to the disease; and satisfactory experiment has been possible only with human volunteers. Reviewing such work about eighteen months ago [1] we referred to the claim of VOEGT [2] in Germany that he had transmitted the infection by injection of serum and by oral administration of duodenal fluid and urine, and we mentioned the work of CAMERON [3] in Palestine which suggested the presence of a specific agent in blood and serum. Already FINDLAY and MARTIN [4] had produced jaundice by intranasal instillation of nasopharyngeal washings from men who had developed hepatitis after inoculation against yellow fever. Hepatitis caused by yellow-fever vaccine (containing human plasma), and other forms of "serum jaundice," correspond closely to epidemic jaundice, though their incubation period has usually been longer—e.g., 60–100 days instead of about 30 days—and their complete identity is perhaps still debatable. A further important step was recorded by MACCALLUM and BRADLEY [5] working for the Jaundice Committee of the Medical Research Council. They described transmission of the disease by administration of materials from early cases; but in their experience frank jaundice resulted only when serum was injected subcutaneously or when fæces were sprayed into the nose and pharynx. They found, however, that a "subicteric" condition resulted from the spraying of the nose and throat with nasopharyngeal washings. The special importance of their work lay in the demonstration for the first time of a causative agent in fæces; from which the question of course arose whether administration into the nose and pharynx led to infection through the mucous membranes of these passages or via the alimentary tract.

Previously, in 1942–43, a detailed scheme for similar experiments had been prepared in the Middle East by Major C. E. VAN ROOYEN and others, and as Professor WITTS, chairman of the Jaundice Committee, has pointed out,[6] this scheme would have been carried out in 1943 if the authorities had not refused permission to use military volunteers in such experiments. However, the plans made in the Middle East were eventually fulfilled by other means, and this week we publish a paper in which Major HAVENS of the Medical Corps of the US Army, Professor PAUL of Yale University, and Major VAN ROOYEN describe transmission experiments made in the United States with materials obtained in 1943 from infected American and British troops in the Middle East. The presence of an infective agent in fæces, inoculable by feeding in gelatin capsules, was clearly demonstrated. Summarising the results of their own experimental work and that of others, the authors conclude that the virus or infective agent is in the fæces and that the disease can be reproduced by feeding such material or by spraying into the nose and pharynx. They show also that it is reproduced by feeding serum from cases, and point out that the incubation period in this type of experiment is about 28 days—i.e., shorter than the period in "serum jaundice." A preliminary communication on p. 212 from Brigadier FINDLAY and Major WILLCOX, reporting further experiments on hepatitis, carried out in West Africa, indicates that the causal agent is present in both fæces and urine, and in the fæces in a filtrable form.

Thus we now have a fairly definite picture of the ætiology of epidemic jaundice, confirming ideas dating back to 1915. The infection is a specific one; the causative agent, probably a filtrable virus, invades the body through the alimentary tract, is present in the intestinal contents and in the blood, is discharged in the fæces and possibly also in the urine, and can be transmitted by materials contaminated from an excretal source or by flies. Whether the virus is also set free from the body in the nasopharyngeal secretion and spread in this way, invading again through the mucosa of the nasopharynx, remains an open question; but it is at least doubtful whether such a mechanism of infection need be postulated in the epidemic disease. Of course much work remains to be done before the virus and its special characters are fully defined; and, as mentioned above, the failure generally to transmit the infection to animals is an obstacle to isolation and study of the virus, and prevents the practical applications that might result from its isolation. The important problem of "serum jaundice" and its relation to the epidemic disease is one that calls for further examination, as does the associated problem of unrecognised carriers or latent cases of infection.

While epidemic jaundice has been a conspicuously prevalent disease of various military campaigns in different parts of the world, the same infective

1. *Lancet*, 1943, ii, 418.
2. Voegt, H. *Münch. med. Wschr.* 1942, **89**, 76.
3. Cameron, J. D. S. *Quart. J. Med.* 1943, **12**, 139.
4. Findlay, G. M., Martin, N. H. *Lancet*, 1943, i, 678.
5. MacCallum, F. O., Bradley, W. H. *Ibid*, 1944, ii, 228.
6. Witts, L. J. *Ibid*, 1944, ii, 328.

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hepatitis, occurring in sporadic form or in limited groups of cases, and long spoken of as "catarrhal jaundice," is by no means a negligible infection among civil populations. The results of research indicating an excretal source of infection are therefore significant to those concerned with public health.

Trench Foot

IN the course of this war tissue damage caused by long exposure to low temperature has appeared in a variety of forms. It is probable, but not yet certain, that "trench foot," "immersion foot," "sea-boot foot," "lifeboat leg," and "shelter foot" are all different varieties or intensities of the same condition. A satisfactory comprehensive term has not been suggested, although "peripheral vaso-neuropathy after chilling" [1] is scientifically accurate. As control of the U-boat menace has improved, the incidence of immersion foot has diminished; but with the Allied armies now fighting under wretched conditions on the Western Front reports of trench foot are coming in, though British troops seem to be remarkably immune. In the early winters of the last war trench foot was a major cause of disability, but after the institution of effective preventive measures it was almost unknown by the winter of 1917–18. Trench warfare offered all the conditions for the development of the disorder, and it is not surprising that with modern mobile warfare the incidence should be low. Even today however there must be many circumstances in which men are compelled to spend hours or days in cramped conditions and exposed to cold and wet. Thus last winter trench foot occurred in the Fifth Army in front of Cassino, and doubtless cases are again being encountered in Italy as well as on the Western Front.

Cold insufficient to cause tissue freezing, usually associated with damp, is the essential extrinsic factor. For this reason the incidence of trench foot is always greatest during periods of thaw. Muscular and circulatory inertia are the intrinsic factors. THOMPSON [2] points out that Canadian lumbermen spend long periods exposed to cold and wet but do not suffer from trench foot because they are constantly using the muscles of the lower limbs. For a similar reason the British Tommy, who swears and stamps around when he is cold, suffers less than some of his more resigned allies. Tight puttees and the sharp edge of the fire-step were incriminated in the last war, for any constriction of the lower limbs will favour circulatory stagnation. Once the feet start to swell, boots may constrict, and even wet matted socks may restrict toe movements. Individual susceptibility to cold may also be a factor; many authorities believe that those who have naturally cold sweaty feet are more liable to trench or immersion foot. Certainly a previous exposure to severe cold makes the feet more susceptible.

The condition is insidious in onset. The feet are cold and numb, and in severe cases the sufferer may be unable to stand. When boots are removed the feet are pale or mottled and swollen. After removal from the cold environment swelling may increase and blistering may occur. The full account of trench foot in the history of the last war [3] does not contain a clinical description corresponding to the three phases (prehyperæmic, hyperæmic, posthyperæmic) which UNGLEY and his co-workers [1 4] describe as the cardinal features of immersion foot. But pain is a prominent feature of both conditions—a deep-seated burning or throbbing pain of constant intensity, and also attacks of sharp, shooting pains like the lightning pains of tabes. It has been suggested [5] that these pains are the result of anoxia of sensory nerve-endings. Objective disturbances of sensation, usually of sock or carpet-slipper distribution, become apparent and may persist for long periods. Gangrene ensues in severe cases but is usually superficial. In trench foot environmental conditions make the incidence of sepsis higher than in immersion foot, and tetanus is a real danger—it was the cause of many deaths in the last war before antiserum was used as a routine. Whether the cold-sensitive state, hyperhidrosis, and delayed pains which are such constant sequels of immersion foot also follow trench foot remains to be seen.

It is to be hoped that any opportunities for studying the pathology of trench foot will not be missed. In 1915–16 the experimental work of LORRAIN SMITH, RITCHIE, and DAWSON [6] provided a pathological basis. In this war, BLACKWOOD [7] has been able to correlate experimental work on immersion foot with findings in human biopsy and amputation material. He finds that the chief incidence of the damage is to be observed in muscle and nerve, and that blood-vessels, except those adjacent to gangrenous and infected tissue, are normal. This is at variance with the findings of the previous observers, who considered damage to the walls of the smaller blood-vessels to be the change of primary importance. Around these findings centres the problem of pathogenesis. One hypothesis, based largely on LAKE'S [8] work with tissue cultures, is that tissue damage is a result not of the low temperature per se, but of an unbalanced metabolism during the periods of chilling and warming, and of pressure on nerves and blood-vessels by the excessive exudation that warmth produces. A more recent conception is that the damage is done during exposure and that it is attributable to the direct effects of cold and ischæmia. Cold constricts the arteries and arterioles but dilates the minute vessels, and stasis results; organic vascular occlusion need not be postulated.

"It has been established beyond dispute that trench foot can be prevented, and if the principles of prevention are grasped and the details carried out with thoroughness and energy success is assured": thus the *Official History* [3] of the last war. This time the British and Russian armies seem to have profited by the experience of 1914–18 and adopted efficient prophylactic measures. The principles of prevention are: keep the feet warm, clean, and dry; maintain general fitness and a high morale. To this end the correct planning and architecture of trenches and

1. Ungley, C. C., Blackwood, W. *Lancet*, 1942, ii, 447.
2. Thompson, R. J. C. British Encyclopædia of Medical Practice, 1937, vol. v, p. 440.
3. Grattan, H. W. Official History of the War, 1922. Medical Services. Surgery, vol. i, p. 169. Hygiene, vol. ii, p. 295.
4. Ungley, C. C., Channell, G. D., Richards, R. L. To be published.
5. White, J. C., Warren, S. *War Med.* 1944, **5**, 6.
6. Smith, J. L., Ritchie, J., Dawson, J. *J. Path. Bact.* 1915-16, **20**, 159.
7. Blackwood, W., Russell, H. *Edinb. med. J.* 1943, **50**, 385. Blackwood, W. *Brit. J. Surg.* 1944, **31**, 329.
8. Lake, N. C. *Lancet*, 1917, ii, 557.

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dugouts, the supply of dry socks, dry rubber boots, and hot food to troops in exposed positions, the prevention of inertia, and insistence on proper foot-drill are the main essentials. The value of rubbing the feet with oil is undecided; in the last war the general conclusion was that it was an accessory but non-essential measure, and that as much good resulted from the rubbing as from the presence of the oil. With regard to immersion foot, the opinion is that more harm than good may result from massage, because the tissues tend to become friable and are easily damaged. In the early stages before there is much swelling gentle rubbing is probably beneficial and the oil may have some slight insulating effect. The prevention of trench foot depends on good discipline and good organisation, and it is significant that preventive measures are the responsibility of platoon officers, not medical officers.

The treatment of established trench foot is still controversial. There seems no doubt that rapid warming of chilled extremities is bad; the question is whether to cool or not to cool. Those who advocate cooling maintain that by so doing a balanced metabolism is assured, but neglect LEWIS's observation [9] that cold below 15° C is harmful to tissues. No-one denies that once the feet have become hyperæmic cooling even with ice may have a therapeutic value for the relief of pain; but when this is done the tissue temperature does not fall below 21° C, the optimum temperature for protracted therapeutic cooling.[10] To keep the feet clean, dry, elevated, and exposed to an equable room temperature while the trunk and arms are kept comfortably warm under blankets appears to be a logical and satisfactory procedure. In most cases the feet become hyperæmic as a natural reaction to their exposure, and there is no need to accelerate the process by sympathectomy, reflex vasodilatation, or vasodilator drugs. The necessity for the administration of antitetanic serum, and, if gangrene develops, for surgical conservatism, are two lessons of the last war that have been reaffirmed in this.

Penicillin by Mouth

THE ease with which the sulphonamides can be administered by mouth has set a high standard for chemotherapeutic drugs, refined even to the point at which the varying degree of absorption of the different sulphonamide compounds from the intestinal tract has been used to enlarge their therapeutic range. Penicillin, a highly soluble substance, is also absorbed from the intestine, as the earliest experiments at Oxford [11] showed; but there the similarity ends, for while the one type of substance is relatively stable the other is destroyed by, among other things, acid, and the enzymes of species of bacteria commonly found in the lower bowel. The difficulty therefore of getting the penicillin unchanged to the site of absorption is great. Further, it is by no means certain that apart from these pitfalls the process of absorption from the intestine may not involve some loss which does not occur after parenteral administration, since a smaller proportion of the amount administered is usually recovered in the urine if it is given by mouth than if given parenterally. These considerations, together with the scarcity of the drug, led the Oxford workers to recommend parenteral administration, a recommendation which up to now has been universally accepted, in spite of the fact that, as GARROD [12] has said, parenteral treatment must be "arduous for those in charge and disagreeable for the patient." This complexity of administration has at least ensured that the great majority of patients receiving penicillin have been treated in hospitals under conditions ideal for laboratory investigation and control. Thus a body of scientific knowledge has been built up such as is rarely gained with a new drug of wide applicability, and which vastly increases and will increase its value.

Although the parenteral route was established early on as the one of choice in penicillin therapy, some information about the behaviour of the drug in the alimentary tract has been accumulated. In 1940, among their first published observations, the Oxford workers [11] noted that penicillin was absorbed from the intestine of the rat without damage to the mucosa. Later [13] they reported absorption from the intestine of the rabbit, cat, and man, though the level in the blood and the percentage recovered in the urine varied considerably between the different species and between individuals within each species; thus the rabbit appeared to destroy penicillin to a greater extent than the cat or man, since by the methods then available no penicillin could be detected in its blood and little in its urine. A child of 6 months given penicillin with sodium bicarbonate by mouth was cured of a *Staph. aureus* urinary infection, though seeing that penicillin is greatly concentrated by the kidneys this was not evidence of a blood-level adequate to treat a systemic infection. Rectal administration resulted in very poor absorption because bacteria in the fæces destroy the penicillin. Acid-resisting capsules were thought too unreliable to be entrusted with such a valuable drug, and were later shown [14] to dissolve at widely different times in the same person on different occasions. At this time (1943) an attempt was made to treat two patients by capsule and duodenal tube. Although the dosage would now be thought entirely inadequate for the conditions treated, and there was no clinical response, antibacterial activity was demonstrated in the blood as well as the urine of both patients.

In America RAMMELKAMP and his collaborators [15, 16] were then investigating the absorption and excretion of penicillin given to man by various routes, including the mouth, duodenum, and rectum. In-vitro studies showed that saliva, bile, succus entericus, and pepsin did not destroy penicillin, and that destruction was proportional to the acidity of the gastric juice. With adequate absorption after an oral dose—for instance in an achlorhydric subject—a bacteriostatic level was maintained in the blood-serum for at least as long as after intramuscular injection of the same amount; in two such subjects 23% and 40% was excreted in the urine. After administration by duodenal tube the blood-level rose and fell sharply,

9. Lewis, T. *Brit. med. J.* 1941, ii, 795.
10. Safford, F. K., Nathanson, M. B. *Arch. Surg.* 1944, 49, 17.
11. Chain, E., Florey, H. W., Gardner, A. D., Heatley, N. G., Jennings, M. A., Orr-Ewing, J., Sanders, A. G. *Lancet*, 1940, ii, 226.
12. Garrod, L. P. *Brit. med. Bull.* 1944, 2, 2.
13. Abraham, E. P., Chain, E., Fletcher, C. M., Florey, H. W., Gardner, A. D., Heatley, N. G., Jennings, M. A. *Lancet*, 1941, ii, 177.
14. Florey, M. E., Florey, H. W. *Ibid*, 1943, i, 387.
15. Rammelkamp, C. H., Keefer, C. S. *J. clin. Invest.* 1943, 22, 425.
16. Rammelkamp, C. H., Helm, J. D. *Proc. Soc. exp. Biol. NY*, 1943, 54, 324.

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as it does after intravenous and intramuscular injection, but the peak level was less than 10% of that attained by parenteral injection; only 16% of the penicillin given was recovered in the urine, whereas the recovery after intravenous or intramuscular injection was never less than 37%, and usually much more. The same workers observed in another investigation,[17] in which excretion was slowed by diodrast, and also in two patients with renal failure,[15] that less penicillin was recovered from the urine when excretion was delayed, suggesting that there was slow destruction in the body. Similar observations were made in the dog by BEYER et al.[18] RAMMELKAMP and KEEFER also confirmed[15] that after rectal administration a bacteriostatic level was not reached in the blood-serum.

Recently another group of workers in the United States[19] have administered penicillin in large doses (100,000 units) to "normal" subjects by mouth, and demonstrated its excretion in the urine for some hours; from 8% to 33% was recovered. The simultaneous administration of sodium bicarbonate reduced the amount recovered, instead of increasing it as had been expected; but it is to be noted that penicillin is even more rapidly inactivated by alkali than by acid, so that a check on the purity of the bicarbonate is highly desirable. Unfortunately this work is incomplete, since no study was made of the acidity of the gastric juice or of the penicillin levels reached in the blood-serum. Now on another page LITTLE and LUMB produce more data. Some of their findings, such as the high proportion of the drug excreted in the urine after oral administration, conflict with previous reports. Others, such as the use of egg albumin as a vehicle for oral administration, are new, and their scientific basis has yet to be elucidated. In view of the promise of easier and more comfortable therapy which these investigations hold out, they deserve repetition and expansion, using the most refined methods of assay available. But as long as the supply of penicillin falls far short of potential demand, as it does today, no-one will wish to introduce a new method of use without complete assurance that it is economical as well as effective.

A MEDICAL PRINCIPAL

IT is perhaps one sign of the Oxford medical renaissance of the last twenty years that Somerville College should have broken with precedent by appointing a woman doctor to be its next principal. Dr. Janet Vaughan's qualities and experience abundantly justify the innovation. She has a scholastic and literary background as the daughter of the late William Vaughan, headmaster of Wellington and Rugby, and granddaughter of John Addington Symonds; her investigations at University College Hospital and the British Postgraduate Medical School brought her into the first rank of hæmatologists; during the war she has administered a large blood-supply depot; she is the first woman counsellor of the Royal College of Physicians, and serves on its committee on social and preventive medicine; she is one of the seven trustees of the Nuffield Foundation; and her other public work includes membership of the Goodenough Committee, the Royal Commission on Equal Pay, and the small body of experts who have recently been in India advising the Bhore Committee about medical education. Forty-five years of age, she married in 1930 Mr. David Gourlay, and they have two daughters.

17. Rammelkamp, C. H., Bradley, S. E. *Ibid*, 1943, **53**, 30.
18. Beyer, K. H., et al. *Science*, 1944, **100**, 107.
19. Free, A. H., Leonards, J. R., McCullagh, D. R., Biro, B. E. *Ibid*, 1944, **100**, 431.

Annotations

DRUGS FOR MALARIA

WRITING under this title on Nov. 18 last we remarked that "although malaria has always been of immense importance to the British Empire, we owe our escape from a dangerous position to the enterprise of the German chemical industry supplemented by American energy in applying the product to military purposes." All will agree that the Allies are indebted to the German workers who invented mepacrine ('Atebrin') before the main quinine-producing areas were taken by the Japanese; but it has been pointed out that our comment does less than justice to the precautions taken by the British Government to build up a reserve stock of quinine, or to the success achieved by British manufacturers in producing mepacrine. Since the war of 1914–18, when quinine supplies were secured only by delicate negotiation, the possibility of a shortage in war-time has, we are informed, been fully appreciated by the authorities in this country. In 1938 arrangements were made to ensure that as much quinine as possible was held throughout the Empire: a considerable national reserve was purchased, and in addition at least two years' supply was obtained and held by most of the Dominions and Colonies. The manufacture of synthetic antimalarials is a complex process, and mepacrine was not made completely in the United Kingdom on any large scale till 1941, when intermediate substances were no longer obtainable from France. Thenceforward, however, progress was rapid. It was in March, 1942, that the Japanese overran Java, which provided over 90% of the world's supply of quinine, and by that time mepacrine production here was already considerable. Officers of the Ministry of Supply at once visited the USA to arrange a joint programme for further production, and this was fulfilled as successfully here as in America. In 1943 the output was 40 tons, and this amount was more than trebled in 1944, when at least 150 tons was produced. Each ton provides about 10 million tablets, and in 1943 over 395 million tablets made by three British firms were allocated to the Services, Dominions, Colonies, and certain Allied and neutral countries. The 1944 production will satisfy demands approaching 1500 million tablets, and it is already evident that such demands will be exceeded and met in 1945.

WHAT DETERMINES POLIOMYELITIS EPIDEMICS?

LABORATORY mice sometimes contract a virus disease, often called Theiler's disease after its discoverer. This resembles poliomyelitis in man so closely that many have hoped to learn more of the human disease by study of its murine counterpart. A first exciting step was the discovery that Theiler's virus is to be found in the fæces, and (less abundantly) in the intestinal walls, of almost every young mouse. Nevertheless, naturally occurring paralysis was extremely rare. This fitted in with the current tendency of students of human poliomyelitis to pay more attention to the intestine and less to the nose as a portal of entry. Poliomyelitis virus was recovered from stools more readily than from throat washings; it was found in sewage; it turned up in flies caught in the wild state. Theiler's virus is often of low neurotropic tendency; so suggestions were made that human poliomyelitis virus was, like it, ubiquitous, but not always sufficiently strongly neurotropic to be demonstrable by inoculation into monkeys.

Why should a ubiquitous denizen of the intestines reveal its presence by causing epidemics of nervous disease? Sven Gard[1] of Uppsala has made some observations on the mouse disease which may afford a clue. In his stock of mice, producing 6000 animals a year, Theiler's virus was regularly present in the stools of

1. Gard, S. *Yale J. Biol. Med.* 1944, **16**, 467.

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young mice, but paralysis appeared only sporadically—in 2 animals during more than three years. There were also, however, two "minor outbreaks," involving 4 and 5 cases. First, in July, 1941, there was an outbreak of infection by *Salmonella enteritidis* (Gaertner's bacillus). While this was at its height in the two following months, 4 cases of paralysis occurred and histological study showed the typical picture of Theiler's disease. The virus was recovered from the central nervous system and lymph-nodes of one mouse, but difficulty in obtaining mice of a clean stock prevented exhaustive studies. The second "minor outbreak" also coincided with an epizoötic in young mice which was characterised by profuse diarrhœa. Necrotic spots in the livers of affected animals showed thread-like organisms which could not be cultivated, but were identified as the *Bacillus piliformis* of Tyzzer. A batch of 100 mice affected with the disease was set aside for study, and after three weeks all but 16 had died. Of these survivors, 5 had flaccid paralysis of the hind legs. Strains of Theiler's virus were recovered from the central nervous system and intestinal lymph-nodes, but could not be continuously propagated by intracerebral inoculations.

In these observations Gard sees a possible clue to the epidemiology of poliomyelitis in man. May not an intestinal bacterial invasion open up the way for our ubiquitous virus to reach the lymph-nodes, where it is at least one stage on the road to the central nervous system. May not the minor illnesses associated with poliomyelitis epidemics be, after all, not abortive cases of the disease, but rather instances of an associated infection which, in the unlucky, opens the way to an attack by the virus? A biphasic or "dromedary" type of fever curve is said to occur in 60% of cases in some epidemics. (To be zoologically correct we should call it a Bactrian-camel curve.) May not the first wave be due, not to a systemic invasion with poliomyelitis virus, but to the associated infection? May not the seasonal incidence of poliomyelitis have more to do with the spread of intestinal infections than of the virus itself? These suggestions may prove right or wrong: they at least open up an interesting line of thought.

We are accustomed to the idea that virus infections pave the way for secondary bacterial invaders. The notion that bacteria may pave the way for viruses is not new, for we know of herpes simplex activated by pneumococcal and other infections, and we may yet learn that there is a rheumatic-fever virus activated by streptococci. But the way of the epidemiologist is hard if in seeking the cause of epidemics of disease immediately due to organism A he has to look for factors favouring the spread of organism B.

DELAYED AMERICAN JOURNALS

THE irregularity and delay in the arrival of medical and scientific journals from America are still almost as bad as in the worst days of the battle of the Atlantic. The journals, it is true, do arrive in due course—whole issues are no longer irrecoverably torpedoed or pages obliterated by a too-zealous censor, misfortunes which were cheerfully borne in 1941—but they lose much of their interest from being two months or so out of date. Some allowance must no doubt be made for the conditions of publication in the United States, where though paper is plentiful printing may be held up by priorities which do not extend to scientific publications. Thus a monthly journal may appear long after its nominal date, and its final arrival here be correspondingly late. But this cannot apply to such a regular and important weekly as the *Journal of the American Medical Association*. It is bad enough that this should always reach us at least six weeks after publication without two consecutive issues being delivered together, one six and the other seven weeks old. A Gilbertian touch is added by a Board of Trade notice that parcels of scientific journals from the United States are liable to seizure by the British Customs unless an import licence has previously been obtained by the importer, even when the journals are unanticipated gifts. How is one to apply beforehand for a licence to import a gift of which one knows nothing till told that it is impounded by the Customs Office? But the regular issues of the journals can hardly be being delayed by the Customs. Where the delay does arise is a matter of some public concern. When news can arrive hot by radio or cable, scientific and medical information should be available from our closest allies as regularly as war conditions allow and at least as promptly as ordinary mail. Medical research surely deserves some privilege and priority.

PLASTIC ARTIFICIAL EYES

FOR some years British and American investigators have been examining the possibilities of the acrylic resins for making artificial eyes. The glass eye has done admirable service in the past, and a well-made glass eye in a good socket can have a very lifelike appearance. But all glass eyes suffer from disadvantages. They break when dropped—no unlikely occurrence in the daily manipulations required to insert and remove them—and they have a life of two years at most, for the chemical action of the tears causes corrosion and roughens the smooth surface of the glass, and this in turn leads to a sore and inflamed socket. Suitable acrylic resins have been devised which are more durable and lighter than glass, and can be trodden on without breaking. Being more workable than glass they permit of a more exact fit to the socket, and an elaborate technique for making them is now employed by the United States Army medical service. By using a plastic material of low melting-point which just sets at body temperature a cast of the eye socket is taken. From this original, successive positive and negative moulds are taken until finally a negative mould of the eye socket is obtained into which liquid resin can be poured. The iris has previously been painted on a fine celluloid disc, and this is incorporated in the plastic eye, together with conjunctival vessels made of rayon threads, the whole being finished off in a clear plastic solution which gives an appearance of moistness. The results, both in comfort and appearance, are said to be well worth the trouble. Later modifications will no doubt shorten and simplify the technique.

PENICILLIN AND SUBACUTE BACTERIAL ENDOCARDITIS

SUBACUTE bacterial endocarditis is among the more distressing tragedies of human illness. Usually seen in young people, it is a threat to all those with a rheumatic or congenitally deformed heart. The discovery of penicillin has raised hopes that here at last might be a cure, though reports from America have so far been no more than suggestive.[1] No investigation will be convincing unless it is based upon a reasonably large series of cases, and our readers will be glad to see the announcement on another page by the Penicillin Clinical Trials Committee of the Medical Research Council that they are establishing ten centres to which physicians are invited to send their cases. The patients will be given penicillin according to an orderly plan, and followed by clinical and bacteriological studies, so we should soon learn whether there is an immediate response. The ultimate effect cannot be judged without observation over several years, but even a successful immediate response would be an advance on present results and would justify further investigation. On the other hand, initial failure would enable us to change our tactics and seek some other line.

1. See *Lancet*, 1944, ii. 117. *J. Amer. med. Ass.* 1944, **126**, 233. *Amer. Heart J.* 1944, **28**, 669. *Nav. med. Bull., Wash.* 1944, **43**, 1010.

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Special Articles

THE WOUNDED IN THE LOW COUNTRIES AND GERMANY *

FROM OUR SPECIAL CORRESPONDENT

THE medical organisation of the 21st Army Group is as extensive, as elastic, and as mobile as the other branches of the Army services. It serves at the bases in Belgium and Holland and it goes with the advanced forces as near to the fighting line as the units belonging to individual formations require.

The Aid-Post

The regimental aid-post in present war conditions is a very movable, and very much moved, organisation. The RAP I visited at Waldefucht in Germany had been very much in action two days before. Two of its ambulances and one ambulance jeep had been shot up at about 6 in the morning by a Tiger tank just outside a small house in the remains of which it was installed. And the officers and men of the RAP had had a front-seat view of a battle across the street about 50 yards away between six Tiger tanks and a six-pounder gun commanded by an officer and sergeant of the KOSB's. At a few yards' range two of the tanks were knocked out by a six-pounder and the other four withdrew. The destroyed Tiger tanks were still on the scene, but the blood of the wounded officer and sergeant which had stained the snow had disappeared.

Waldefucht is a little town with two ancient gateways of brick still guarding the road as it enters and leaves. Perhaps there are remains of walls around this little place, but I did not explore them, for there were many mines and no certainty that all had been located. Even walking round the house, which had been a very completely stocked chemist's shop, we had to be very careful indeed. Going round the house I was piloted by a junior RAMC officer and the assistant director of medical services of the division. The ADMS asked whether the ground had been tested for mines. The medical officer replied that he was not sure, and added, with Sir Walter Raleigh politeness: "Let me go first, sir." On which the ADMS, who has the reputation of preferring to be with the leading platoon in a fight rather than at a field-ambulance station, snorted and walked straight on. I followed as carefully as possible. None of us was blown up or even shoe-mined. The shoe-mine is a little mine, but big enough to damage a leg badly if trodden upon—and take another man out of action.

In the shop I saw three rooms full of bottles and jars containing drugs, and large tiers of drawers filled with pharmaceutical and medical necessaries; also an extensive distillation plant in one room, and there was a well-stocked basement besides. Most of the things were undamaged, but there was a fall of bricks and underfoot rubble in one place, with the remains of an excellent weighing machine, labels, bottles, and unidentifiable fragments trampled into the debris. One wondered if the chemist who had fled before the troops arrived had booby-trapped any of his many cherished possessions.

The RAF had installed itself in a house not far from one of the great entrance archways of the town, which were of a beautiful old red brick and built at some time in the considerable thickness of an old city wall. The vault of this entrance way, about 20 feet long, was built with curving supporting arches which must have been the pride of some builder craftsman's heart. Now there were large chunks hacked out of the brickwork at one side where a Tiger tank had jammed and shot itself free, and scars and wounds where flying shell fragments had knocked off a brick or two or excavated a hole in a wall.

The main dressing-room of the RAP was in the sitting-room of the house just to the left of the entrance where the front door had once been. Some of the furniture—a modern and ugly small sideboard, a sofa, a stuffed armchair, and another chair or two and a table—were still in the room. On the sofa was a case with stocks of bandages and dressings. On the table was a spirit-stove steriliser cooking up a hypodermic. In a corner in a case were splints and more packages. Mud from the road outside had been tramped into the room, but the essential ring of cleanliness around bandages and dressings was maintained amid the weltering dirt of war. Down below, down concrete steps, was a concreted cellar with a very small window high up, which, however, gave a good light to a neatly arranged and very full supply store. The concrete cellar was strong, and in this old town there were many more such modern intrusions in its very much older architecture. It was said that these cellars represented a line of outposts of the Siegfried Line which is not very far away.

The operation on which the RAP had been functioning, and indeed was still functioning, was based at Sittard in Belgium, and had been one which had cleared a big loop in the river Maas beyond which the Germans had retired. The question now being asked was, were the Germans retiring still farther and were they leaving the Siegfried Line to hold instead the line of the river Rhine?

Nothing very active was happening at the time of my visit. Some bangs and cracks of shells at long intervals were all there was to be heard, but there was always the possibility that some final sniper had been overlooked, although it was believed all had been cleared out. In a wood near at hand there were still German bodies. But the MO said that he had not smelt any dead Germans that day.

CIVILIANS

The main street of Waldefucht curved to the left as it passed through the gate by which I entered, and opened on to a vista of houses gashed with shell-holes, collapsed roofs, and walls cascading into the street—one with a foaming wreckage of household furniture as a crest to a wave. It was desolation, savage destruction, and the grime and sordid detail of war left over. There was a smell of dust and rubble, of filth and faint putrefaction.

A big and once-beautiful old church in the main street was scarred with shell marks, picked out with gaping holes by shell hits; its steeple, with a fretwork pattern of shell-holes, crazily maintained an upright position. And in the street the mud churned up and squelching over everything—a stream of lorries, tracked vehicles, guns, tanks, and ambulances, and, recently, men on foot.

Looking into the courtyards of two houses—the farm courtyards they were with doors of open barns—I saw in one an old, old woman and two small children. In another I had a glimpse of a woman of about 30, robust-looking, blonde, stepping briskly across the farmyard debris with a bucket in her hand. I also saw in the street an ancient and etiolated old man. There were said to be 500 Germans in the place, mostly living in their cellars, and many of them had applied for treatment to the MO at the RAP. He had evacuated one case of tuberculous meningitis and another of diphtheria. But most of the cases were not serious and he was in any case handling them over to the Civil Affairs doctor as soon as he arrived. It was said that a German civilian doctor was to be made available at any moment.

IN ACTION

The attack which brought our forces into Waldefucht, and a good deal beyond it, threw a great strain on the medical services. One position captured by tanks, after a considerable detour over tank-possible country, could

* Sequel to last year's articles, entitled The Wounded from Normandy (*Lancet*, 1944, ii, 253, 278, 383).

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not be approached directly from the position originally established by the MO for a dressing-station, except in an amphibious vehicle. A temporary collecting-post was therefore established in the captured position on the first day, and the wounded were taken there. But the road line of evacuation was closed by the enemy, so that field-ambulance transport could not use it. The ADMS of the division decided under the circumstances to evacuate the relatively few abdominal and chest cases by the amphibious vehicles through the field ambulances, and the commander of the troops decided to clear the road for the evacuation of the remainder by the necessary short and sharp attack. This having been done successfully, evacuation of casualties from the tank battle was carried out by the road cleared and the RAP went into its next position. Most evacuation is carried out by ambulance, long hauls by bearers carrying stretchers are rare.

As I was leaving the RAP a group of men formed up outside. They were due for an inoculation. The MO excused himself and got on with the job. Fighting, marching, sleeping one day in the shelter of a house or cellar and the next day in a foxhole, the mobile warfare is not allowed to interfere with the carrying out of hygiene measures.

Trench foot is avoided—there is practically no trench foot among the British forces—by the well-known discipline of changing socks and rubbing the feet and legs. All soldiers carry extra pairs of socks, a favourite place to stow them being one over each shoulder under the battledress. Infection by lice and scabies is as rare in this war as it was common in the last. The mobile bath unit has a high priority. Rations are of course very good. And medical front-line requirements are as efficiently supplied as artillery front-line requirements. Oddly enough, as all with active service experience know, gunners and medical units have a way of competing for positions to carry on their jobs. The map reference X which suits the field ambulance has a way of suiting equally well the gunners. Nowadays the claims of the ambulance have at least equal priority, and when the ADMS is active and belligerent the gunners by no means always come off best.

The casualties in the very successful action in which the RAP which I visited took part as one of a number, all of which I did not see, were officially described as "light." Light they were in both dead and wounded, but they added one more little cemetery behind the front line where I saw the graves being neatly ordered and the wooden crosses in rows behind being put up. So it is a good thing to know that the medical services not only restore a large proportion of the wounded to their pre-wounded health and activity, but also save from death a large number who, in previous wars, would have been beyond hope.

Field Ambulance and CCS

Behind the line of regimental aid-posts of battalions and other units lies the line of field ambulances and the hospital line of casualty-clearing stations and of advanced surgical units.

Field ambulances fulfil the same functions in this war of 1939–45 as they did in 1914–18. They are more mobile; they work even more closely with the battalions; and they have developed new forms for paratroop formations and armoured formations. But the differences are in adaptation to new conditions, not in their essential functions of acting as a link between the units of a division and the hospital formations behind it.

The CCS and the advanced surgical unit are often very near the fighting line. In a recent operation one of them was for a time only half a mile away—a period of some anxiety for those concerned in safeguarding the line of evacuation of wounded farther back and the safety of the personnel, including nursing sisters, of the CCS. But the medical services—including the sisters—are not only in battledress, but also very much in the mood of high-speed battle efficiency.

BUILDINGS OR TENTS?

Up to the time of my visit at the beginning of this month it had very often been possible for a CCS to find a good building in sound repair in which it could set up its reception-rooms, its wards, and its operating-theatre or theatres, and house its personnel. This was because the fighting in southern Belgium and Holland was in areas which the Germans evacuated so quickly that destruction was on a large scale only where resistance was heavy and fighting intense. A long way out from Brussels towards the fighting area villages and towns have received comparatively minor damage. Driving through these places there are few signs of physical destruction, and in some there are no signs at all. The shops, the houses, the churches, the schools, and the other public buildings seem to be as they have been for many a long year past. The fields are tidily and (one presumes) well cultivated, for the Belgians are good and industrious farmers.

But what the conditions will be as we progress further into Germany it is difficult to foretell. If the Germans resist stubbornly, as they did at Aachen, the houses and public buildings will no longer be available for medical uses.

Not that this will worry the CCS commanders. Indeed for some reasons the setting up of the CCS in tents is to be preferred. The wards, operating-theatres, and other parts of the hospital organisation have not then to be fitted into a given building, but fall into their places in the tent space allotted them. Incidentally, this makes the layout simpler, and the CCS in tents can be put up anywhere, provided the condition of the ground is suitable. In the phoney war of 1940 the CCS's in France were operating on plans of organisation and transport now modified to fit in with the conception of mobile warfare. The school of the desert campaigns taught the Army very much. Now a CCS is a highly mobile organisation moving on a strictly limited amount of transport and able to be dismantled at one place and re-erected at another in an astonishingly short time. The CCS, helped by the addition of special surgical teams —one, two, or more as required—is capable of dealing with any call that may be made upon it.

WORK OF CCS

At one CCS which I visited it was the practice to keep cases of abdominal and chest wounds for about 10 days, to send head injuries straight on to hospitals farther back especially equipped to deal with them, and to evacuate normal cases as fast as could reasonably be done.

The CCS deals not only with battle casualties but with any casualties to Service personnel which may occur in its vicinity. I saw a Sten-gun accident case brought in for operation from the immediate neighbourhood of one CCS; and these hospitals also deal, for instance, with road accidents.

Another function of the CCS is the provision not only of emergency dental work but of conservative dentistry and particularly artificial dentures. At the CCS there are not only first-class dentists but first-class dental mechanics. The making of artificial dentures is done very quickly, and a man who might have to waste months if he had to go to base for artificial dentures can now get them in days. He is also sure of getting them at once instead of having them follow him by post as happened when dentistry was done at base.

Dental service, including the provision of artificial dentures, is given also in the divisional areas in advance of the CCS, operationally through the intermediary of the mobile dental units.

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One CCS I saw was in a large building in a town. The installation for advanced surgery was in an experimental wing of a factory. It cannot often be that an advanced surgical unit finds itself installed in a building with tiled floors, glazed brick walls, excellent central heating, and first-class electric lighting. But so it was, and the acting OC of the CCS asked me to be sure to make it plain that surgical work in advanced areas is not done in foxholes, as some of his friends in England seemed to think.

It is in the CCS area that modern surgery has had some of its greatest opportunities and contributed most to the saving of life. Surgery at the field-ambulance level is best restricted: the business of a field ambulance is to get the wounded back as quickly as possible to the CCS. And at the field ambulance blood-transfusions should not be done except in cases of grave emergency. But in the CCS much surgery can be undertaken, and it is to the surgery at advanced units at the CCS that perhaps the greatest advances in the saving of life and health have been made in this war.

Evacuation

Evacuation from the CCS to areas farther back is partly by motor ambulance, partly by ambulance train, and partly by air. Cases which will need a long period of treatment are sent preferably by air. From advanced air-strips planes take many cases on an air-lift to hospitals farther back. From these hospitals they can be evacuated to England by the Air Evacuation Service and by hospital carrier. It is not possible to dispense altogether with any means of evacuation. The motor ambulance is indispensable for short distances, and on occasion for special reasons can be used for long distances. Evacuation by train and hospital carrier is also indispensable. Given the right weather, evacuation by air is to be preferred in all cases. But weather cannot be guaranteed. There may be periods, for days together, when the air-lift from the forward air-strips for evacuation by plane from the air-fields farther back is impracticable.

In practice, about a third of the wounded are evacuated by air and the remaining two-thirds by train and sea. But proportions may alter as weather improves, and as—with the advance in Germany—the line of evacuation gets longer. In this field of operations, as in every other, the Army medical organisation is very mobile, very adaptable, and capable of meeting the demands of any operational situation.

VARIED CIRCUMSTANCES

The sample of front-line and CCS medical arrangements which I saw was only a part of the whole long front on which operations are proceeding. It was in the southern part, near Maastricht, in that tongue of Holland which lies between Belgium and Germany. Conditions near Eindhoven or in other places would be different. But the organisation of the medical service is so adaptable that it has been able to meet any conditions which may present themselves. The range of experience of the medical officers is also very wide indeed. For example, the senior medical officer who took me round the CCS had been in charge, in another capacity, of the medical operational work at Arnhem. An ADMS whom I met had added to his duties in the island of Walcheren, where he happened to be with the advancing troops, by personally carrying a wounded commanding officer out of the line.

First-class work is being done by medical formations under many different circumstances. None have so far been met which have prevented the Army medical organisation in the line and immediately behind the line from carrying out its functions successfully.

(To be concluded)

ROYAL COLLEGE OF SURGEONS

RESTORATION AND DEVELOPMENT FUND

ON Feb. 14, the birthday of John Hunter, Sir ALFRED WEBB-JOHNSON, the president, sent the following letter to each fellow of the Royal College of Surgeons:

"The time has come when we must prepare for the restoration of our college. The sum which will be received from the War Damage Commission will not cover the whole cost of restoration: moreover we have a unique opportunity to carry out many improvements which will make our college an even more worthy headquarters of British surgery. Among the amenities which it is proposed to provide are a large conference hall, common rooms, extensions of the museum and library, accommodation for the new professors, and more research laboratories. It is estimated that £250,000 will be required to complete the scheme of development. In order to have a free hand in planning, and, at the same time, to provide space for the sister colleges if they decide to move to Lincoln's Inn Fields, the council has acquired several adjoining properties.

"The future scientific influence of the college has been assured by the generous endowments we have received from Sir Buckston Browne and the Bernhard Baron trustees, and from our latest and greatest benefactor Sir William H. Collins. I now appeal to fellows of the college for donations to the Restoration and Development Fund. I realise that commitments vary for all of us and that many of us have suffered considerable financial loss owing to the war, but I want every fellow to feel that he has made some contribution towards making our college worthy of its progressive outlook and great history and traditions.

"Past and present members of the council and court of examiners have subscribed over £10,000.

"The appeal has been supported by the American College of Surgeons, the Royal College of Surgeons of Edinburgh, the Royal College of Surgeons in Ireland and many surgical Associations. Donations can be earmarked for special purposes and can be spread over a term of years. If a gift is intended for the scientific departments a seven-years covenant can be entered into with the result that the benefit to the college will be greatly increased. I rely on you to help as generously as possible."

In present circumstances it is impossible to send this appeal personally to members of the college, and other members of the profession, but it is hoped that all who are interested in the work of the college will join with the fellows in subscribing to the fund. The preliminary subscriptions include £2100 from the President, £2000 as a first donation from the American College of Surgeons, and £1000 from the Royal College of Surgeons of Edinburgh.

On Active Service

AWARDS

DSO

Lieut.-Colonel A. McC. CAMPBELL, MB GLASG., RAMC

MBE

Major J. L. M. ANDERSON, RCAMC
Major F. J. S. BOWMAN, MB ABERD., RAMC
Major N. R. BUTCHER, MB EDIN., RAMC
Major F. O'K. CRAVEN, MD NUI, RAMC
Lieut.-Colonel W. S. HARVEY, MB EDIN., RAMC
Major J. G. JOSE, RCAMC
Major HAROLD KENNEDY, MB BELF., RAMC
Major J. C. LUKE, RCAMC
Major R. L. MACPHERSON, MB EDIN., RAMC
Major H. K. MELLER, MB CAMB., RAMC
Major R. A. MUSTARD, RCAMC
Major P. A. SCOTT, RCAMC

MENTION IN DESPATCHES

RAMC.—Colonel C. E. Eccles, OBE, LRCPI, Lieut.-Colonel C. D. Evans, OBE, MB CAMB.

RCAMC.—Colonel G. A. Sinclair, Lieut.-Colonel J. H. Palmer, Majors G. M. Bastedo, J. K. Bell, J. A. Bradshaw, D. R. E. MacLeod, E. A. MacNaughton, P. J. Maloney, J. A. Melanson, E. Quehl, L. J. Quinn, J. G. Shannon, F. L. Shipp, P. M. Spence, A. R. Tanner, P. K. Tisdale, Captains G. C. Bowes, J. A. Gow, T. Statten.

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In England Now

A Running Commentary by Peripatetic Correspondents

"THE best way to get this country right," according to my son's letter from Greece, "is for England to help at once by setting up a British medical school much as Cantlie did in Hong-Kong. Not only would it be the centre of our future activities, which will be mostly medical in nature, but it would provide modern Greek doctors able to look after this deplorably low-standard (physically) nation. Put forward your best efforts to get such an institution started as soon as possible in Athens. It is not an idealist's dream or a vague philanthropist's reaction to the present-day distress. It is a necessity."

* * *

For my fifth shot at Medicine I was determined to leave nothing to chance. I arrived at Queen Square a good two hours before my clinical and settled down in the cloakroom this time to discover *all* the cases. "There's a chap called Mr. Pluckrose," I was told, "with fibrosis of his right lower lobe following pneumonia. A great supporter of Chelsea—ask him how 'The Blues' are getting on and he's a friend for life. Look out for a little woman with asthma on your left as you go in, and they've got a chap with one of those dystrophy thingamies. Also an old boy with heart-block in a dirty blue muffler."

As it happened I got none of this selection. My examiner left me alone with an attractive young woman in the corner who gave her age as 23 and her occupation as artist's model—an advance on the usual hoary old tabetic, anyway. She was an excellent conversationalist. We chatted about the weather for a little, and the number of times both of us had been up for this particular examination. Was I a Cambridge graduate, by any chance, she asked, for she had recently been working there, in the Art School. I told her I had gone down more years ago than were good for me, and we talked about the Backs in the autumn, just at the beginning of the Michaelmas term, when the weeping willows at Trinity Hall turn an exquisite deep gold and trail in the chilly-looking waters of the Cam; and in the springtime, when the pink and blue crocuses fleck the lawns at Queens' and the shiny banks of daffodils brighten your Sunday afternoon stroll across Trinity bridge. We discussed the perfection of King's chapel, the great lawn gleaming like a green pond in the sunlight, and, later on in the year, the punts lethargically slipping along the river at its foot. "Did you ever hear them sing Madrigals under King's bridge?" I found myself asking her, as the bell snatched me back to the sordidness of life. "I'm afraid I shall have to examine you," I apologised. "I'm a heart case," she explained, undoing her bedjacket, "you needn't bother to look at anything else." "I don't suppose I shall be able to hear anything," I told her sadly, "I never can."

Nor could I: I was already resigning myself to another three months in the non-wage-earning class when she whispered "Did you hear my low rumbling diastolic? You can only bring out my presystolic by turning me on my left side or on exercise—I've never had rheumatic fever, but I had growing pains as a child. My thyroid's a bit enlarged too, they seem awfully pleased if you notice that—I'm perfectly well compensated, and he'll ask you all about a barium swallow." I would have sent her some flowers, but she wouldn't give me her address. "They often ask," she told me sweetly, "but I never give it away. You don't need it in the history, anyway."

* * *

In a 2500 miles' lecture tour in Italy and Malta, I offered three kinds of lectures, all dealing with post-war reconstruction. Not many of my RAF and Army audiences asked for a lecture on the National Health Service, but that was the subject of several gatherings composed wholly or mainly of medical personnel in uniform. One way and another I talked to close on 200 doctors about the future of our medical services.

The RAMC regulars took little interest in the scheme and had no opinions to express: their careers would, they thought, be unaffected. The temporaries were, however, very keen, though about half of them did not know much about it and had not filled up the BMA questionary. They even complained of lack of information, which seemed to me to be a serious failing. But I cannot say that I was surprised. It was a typical condition among the 11,000 officers and men whom I addressed in 34 lectures about all the official plans for resettlement and reconstruction at home.

The first spokesmen at my medical meetings were usually brigadiers and the like—men who were specialists or consultants in peace-time. They were quite emphatically against Mr. Willink's ideas. Sometimes these senior officers rather daunted the rest of the audience, but many men who had said nothing at the meeting told me afterwards that they were either strongly in favour of the scheme or acquiesced in it as inevitable. At some of my meetings they got up and said so in no uncertain manner, and on one occasion practically the whole audience set upon the opposing colonel and tore him, oratorically, limb from limb. I was interested to hear two or three speakers, in various units, argue from their recent Service experience. They had seen in the Forces (Army and RAF) what organised medicine could achieve, and they were converted. They could no longer support private practice as an ideal. My general impression was that the younger doctors are, on the whole, quite favourable to a National Health Service and keen to play their part in it when they come home. May that be soon!

* * *

Me: Is the pain in your stomach better or worse after food?
Patient: (after interval for thought): No.
Me: But does eating make you feel better or worse?
Pt: No.
Me (starting afresh): Well, when do you get the pain?
Pt: (brightening visibly): Ven I press here (indicating gall-bladder area) I get pain.
Me: But why do you press there?
Pt: Ven I press here I get pain.
Me: But *why* do you press there?
Pt: I don't.

* * *

Once or twice when I have been condemned to a week in bed, while feeling mentally active, I have found the only way to prevent myself regretting the things I might have been doing if it had been a week's real holiday was to take up some long book that has stood unopened on my shelf for years. I am sure it is twenty years since I opened the *Poetical Works of Shelley*, a school prize of even earlier date, but a week in bed was the chance of really reading it from cover to cover. Never on normal days would I have had the patience to lose myself in that remote world of beautiful aspirations and bitter despairs. A big Victorian novel, *Middlemarch* or *Vanity Fair*, too formidable to attack on a workaday evening or a summer holiday, will carry you through a week in bed with great satisfaction. Yet reading in bed has its drawbacks. When hot-water bottles are unprocurable to warm your feet, it is essential not to chill your arms and shoulders while turning over pages. Whatever attitude seems momentarily comfortable is unbearably stiff and awkward a few minutes later. I shift the pillows into a new position and the book slips off; I prop the book by a cunning adjustment of knees and blankets and then the pillows have gone crooked. Next time I am ill I must have a machine that turns over the pages. Why not now? For the problem has been solved in America, There, according to a letter in the *Times* of Feb. 1, "a non-profit corporation" is distributing "reading and entertainment in the form of microfilm to the physically handicapped, war casualties, and victims of infantile paralysis." Though I cannot qualify for the beneficence of the non-profit corporation, I should like to procure their gadgets. I shall lie snug and press a bulb under the bedclothes like a camera-shutter extension, the microfilm will slide through its projector, and page after page will be shown on the ceiling. Or if reading palls I can turn on my own movies. I will not let myself anticipate difficulties, but does the toy never jam? Can I be sure that I will not spend a whole afternoon gazing at the same page slightly out of focus on the ceiling? Never mind. What an admirable invention to have materialised into a practical possibility! And now the ASLIB microfilm people have been invited to emulate the Americans and provide these reading machines for the disabled over here.

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Parliament

FROM THE PRESS GALLERY

The Displaced and Stateless

In the House of Lords on Feb. 7 the Marquess of READING said that no real stability could be restored to Europe until the problem of the displaced and stateless people on the Continent had been solved. It was surely no extravagant conjecture that the German leaders, while planning the economic vassalage of Europe, should sometimes have calculated that if defeated they would leave behind such a legacy of slave labour, concentration camps, hostages, war fugitives, and evicted populations as to frustrate for long the efforts of their conquerors to restore tranquillity to the liberated lands. According to an official estimate by the Allied governments this organised upheaval affected between 20 and 30 million people in Germany and German-occupied countries, all of whom had to be identified, collected, sorted, fed, clothed, and ultimately transported back to their homes or what was left of them. It was only too likely that many of these people would have to depend on relief until the gradual and painful process of rehabilitation could begin. It was clear that the return to their countries of these peoples must not proceed according to their own devices and impulses, but must be systematically controlled; otherwise the roads of Europe would be strewn with millions of desperate, exhausted, sick, and starving people, and the hideous anarchy of the end of the Thirty Years' War would be re-enacted on an incomparably greater scale before our eyes.

Presumably, the first approach to the problem would come from the military authorities, whose task it would be to initiate action for assembling and accommodating these people. In the next stage—assuming that it received the necessary formal invitation—UNRRA was supposed to come upon the scene, the only authority in possession of transport, supplies, medical stores, and man-power for building of huts. In a recent debate Lord Cranborne had assured their Lordships that it was not lack of administrative personnel that was hampering UNRRA, but lack of transport. In conclusion the noble Marquess asked how far even now the member governments of UNRRA had awakened to the urgency of this problem. Unless plans were ready to be put into operation swiftly and effectually when the moment came, the seeds of peace in Europe would have been planted in barren and infected soil.

Speaking without inside knowledge, Viscount TEMPLEWOOD said that to him UNRRA seemed to be either unable or unwilling to realise the urgency and magnitude of the task. The three great Allied leaders should announce a common policy. In his view the material side, immense as it was, was less complicated than the moral one. Men, women, and children had been living year after year in inhuman conditions. It did not need a psychologist to say what reactions this tragic period might have had upon them. Side by side with an organisation fitted to act quickly, and on a broad front, there should also be a welfare organisation which could attend to these sufferers for months and years to come.

Viscount CRANBORNE, Secretary of State for Dominion Affairs, said the question was not whether the military authorities or UNRRA should handle the problem of the displaced: it could only be dealt with effectively by the two authorities in combination. The experience gained by UNRRA while working with the military should enable UNRRA later to relieve the military of the burden, and the sooner that could be done the better. In liberated territories, of course, where the civil government was in control and UNRRA had not been invited in, the responsibility remained with the government concerned. But where UNRRA had been asked to help this would be one of their main functions. The problem was on a scale which had never been seen before. There were two ways of tackling it. One was by grasping at immediate aspects which seemed capable of settlement, but which were bound to be dealt with ad hoc and without overmuch regard to similar problems elsewhere. The other method was to deal with the problem as a whole internationally, and methodically work out systems of priority and machinery. It was easy to understand the desire of the advocates of the first course to press on, and to sympathise with their impatience with the international approach as being unnecessarily cumbrous and slow-moving. But there was a real danger that if they had their way they would get the worst of both worlds. Frankly, he did not believe that this was one of those problems which could possibly be tackled on an ad-hoc basis; it was too big and the numbers involved were too formidable. On the whole the results achieved by international action in the past had been disappointing, because not all those nations who paid lip service to the principle of international action were in practice willing to give it a fair trial. In his view, however, we must not allow ourselves to be discouraged by the past. International action in this sphere, as in others, was a plant of slow growth. HM Government recognised the urgency of this problem, but it was no use raising false hopes that there was an easy way out. There was a common policy for repatriation agreed at Atlantic City; there were not yet detailed plans for resettlement. There would be countries of temporary refuge and countries of permanent refuge. In his view the countries of temporary refuge would have to keep a large number of these refugees permanently; he did not believe they could go on moving them about the world. But that was a matter to be thrashed out, and in the meantime these people would have to be looked after as best they could by the International Committee. Certificates allowing people to go into Palestine were allocated by the Jewish Agency.

Health and Education in the Colonies

In the House of Commons on Feb. 7 Colonel OLIVER STANLEY, Secretary of State for the Colonies, moved the second reading of the Colonial Development and Welfare Bill which provides for the expenditure of £120 million for the Colonial Empire over a period of ten years, subject to a maximum issue in any one financial year of £17½ million. This sum, Colonel Stanley affirmed, was not intended to be the sole and permanent support of the social requirements of the Empire. In the long run the social standard of a country depended on its own resources and upon the skill and energy of its people. It would be neither right nor healthy for Britain to attempt to maintain from the efforts of her own people the social standards of colonial territories. The aim of the Bill was to give the colonies the help they must have if they were to start the process of social development for themselves. The House had been warned that it was unlikely in the early stages that it would be possible to spend the full amount granted by the 1940 Act, and in fact only £1 million was spent in the first three years and just over £2½ million in the first four. Yet even despite the practical difficulties which will prevent the full expenditure members on all sides had been urging with enthusiasm the necessity for an increase of the sum allotted in 1940. There was a genuine desire among the people of this country, even at some sacrifice to themselves, to help people with whom they had been so long associated to a better standard of life. The whole House was committed to the doctrine of trusteeship, and beyond that of partnership. There was no reason why something that was good for the colonies should not be good for us too.

Mr. J. DE ROTHSCHILD said it was not only the material resources of the Colonial Empire which had been neglected, but also the human beings. The efficiency of the average African was less than half that of the average European owing to the effect of chronic diseases. Yet the African had proved himself capable of reaching a high standard of efficiency. The native members of the Forces had improved tremendously in physique and stamina under proper health and feeding conditions. It was essential that when these men returned to civil life they, and the other men and women who shared their existence, should have health services, sanitation, and water-supply as good as those provided in the Army. The tsetse fly must be wiped out, hookworm and bilharzia abolished. If the resources of the colonies were to be developed it could only be done by healthy and efficient people who would thus benefit themselves, this country, and the rest of the world. Mr. S. DE CHAIR said that the machinery of government in the colonies was designed for a simpler age. The Colonial Secretary had become

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a bottleneck. He suggested it would be advantageous if kindred subjects in colonial administration, such as education, health, and so on, could be grouped together and made the responsibility of one man.

Dr. H. B. MORGAN asked why West Indians did not receive appointments under the Colonial Development and Welfare Act. It was time that we developed an educational system which would give opportunities to the local indigenous product who showed by what he had done already that he was fit to hold these appointments. Why should medical men from the West Indies with knowledge of local conditions and tropical diseases, as well as West Indian psychology, not be appointed as medical officers to the Comptroller's staff under the West Indian development scheme? Why should a retired officer on pension be given this appointment? This money for colonial development was being spent on a good purpose, but he was against the machinery by which it was being made available. To begin with Colonel S. ALLEN wanted the money mainly to be spent on health and education. Until the figures for venereal disease were considerably lower they would never get an African population which was able to carry on.

Sir WALTER SMILES thought that medical research was one of the means by which the African countries might be brought together. Bilharzia was found on the banks of the Nile and right down into Southern Rhodesia. If the human pollution of all the rivers, lakes, and ponds could be stopped for 24 hours the disease would be stamped out, but no matter how energetic the Secretary of State was he could hardly achieve that. Medical research in Africa should not be confined to the British colonies but should extend from Egypt right into South Africa. Sir Malcolm Watson of the Tropical School of Medicine had been asked to advise on malaria in the copper belt and the mines in the middle of Northern Rhodesia, and the result was that there was now practically no malaria there, although the district was extremely malarial. The Union of South Africa had a wonderful medical service in the mines in Nyasaland and Northern Rhodesia to deal with South Africans who emigrated there, where great attention was paid to the diet of the workers; in no place had he seen any natives who had a balanced diet of their own. But when they went back to Nyasaland they were immediately infected again with bilharzia and they became thinner and more unfit for work. It was all very well to say that the colonies should depend on the energy, skill, and enterprise of the natives, but some of the tropical diseases would have to be stamped out before these poor people had the energy to work as they should.

Colonel STANLEY, in replying to the debate, said that the colonial administrations were fully aware of the need for rehabilitation centres and continued training necessary to fit the returning soldier, not for his old civilian life, but for something better. But it was no good, certainly at the moment, looking for a solution in the direction of making more appointments. The difficulty was to find anything like the number of people to fill existing appointments. He challenged Dr. Morgan to say whether in his lifetime there had not been a progressive growth of posts in the West Indies filled by people born and bred in the West Indies. It was, of course, the policy of the Government, which they were carrying out, to improve the chances of people in the colonies of getting appointments in the Colonial Service, but this showed the immense importance of increasing facilities in the colonies for training them to fill the jobs. It was academic to argue whether education or health should be placed first in these plans, because they could not get anywhere without both.

VOLUNTEERS FOR RELIEF WORK.—Mr. WILLINK said that of the 40 local authorities who had been invited to consider the temporary release of medical officers for service with the Civil Affairs organisation in the liberated countries of Europe so far 14 had consented.

REFRESHER COURSES.—Mr. WILLINK said that his scheme to provide refresher courses for serving medical officers would include qualified and registered practitioners now serving in HM Forces not as medical officers.

QUESTION TIME

Education of Handicapped Children

Mr. R. C. MORRISON asked the Minister of Education what steps he has taken in fulfilment of the promise given in the debate on clause 31 of the Education Bill to consider appointing an advisory committee on handicapped children.—Mr. R. A. BUTLER: I have appointed the following to advise me on such matters relating to children requiring special educational treatment as I may submit to them or as they may consider require investigation: Mr. F. Messer, MP (chairman); Dr. J. M. Mackintosh, professor of public health at the London School of Hygiene (vice-chairman); Dr. A. A. E. Newth, senior school medical officer for Nottingham, and Mr. E. W. Woodhead, director of education for Kent. To assist the committee in their consideration of any specific question, I shall, from time to time, appoint as additional members persons possessing special knowledge and experience of the particular category of handicapped children concerned.

Malnutrition in Liberated Countries

Earl WINTERTON asked the Prime Minister if he would cause a command paper to be published showing, on the information of British representatives, the amount of malnutrition and lack of commodities essential for health in France and the freed portions of Belgium and Italy; how far this was due to allied military requirements of ships and rolling stock; and the steps being taken to relieve the situation.—Mr. C. ATTLEE replied: The responsibility for the provision of commodities essential to health for liberated territories during the military period is one for the combined United Kingdom/United States military authorities. In making their preparations these authorities have naturally had to take into account the severe limitations imposed by shipping, port capacity, and internal transportation. These factors have greatly increased the difficulties of dealing with the situation and it has therefore not yet been possible to maintain or even to reach the full standards aimed at in all cases. But the reports received do not indicate any serious malnutrition, except in certain areas where it existed before liberation. In areas where fighting has recently taken place it is particularly difficult to restore the disrupted distributive system. The combined military authorities are, however, making special efforts to effect such improvements as are possible in present conditions. At the present time I do not think there would be any advantage in issuing a white-paper on these matters.

Earl WINTERTON: In view of the fact that independent evidence completely contradicts what the Minister says, and is to the effect that millions of people are on the verge of starvation and in a worse state than they were under German occupation, how can the Minister refuse to publish information, and is it not the case that members of the Forces would not want to avail themselves of leave trains or NAAFI supplies, if they were doing so at the expense of starving French babies?—Mr. ATTLEE: The question is based on an assumption which is entirely groundless.—Earl WINTERTON: It is not.—Mr. ATTLEE: There are no leave trains interfering with the supply of commodities. What I have stated is based on the facts known to us from official reports that we have received on conditions. I agree that conditions are not as we would wish them to be, but there is really no point in making exaggerated statements.

Mr. A. H. E. MOLSON: Are we to understand from the Deputy Prime Minister's reply that this immensely important matter of the relief of great civilian populations is left to the military authorities? Is not this a political issue of the utmost importance?—Mr. ATTLEE: Statements have been made as to the arrangements made. There is a period in which this is dealt with by the military authorities, and later on it passes to the civil authorities.

Mr. A. BEVAN: Is the Minister aware that very large quantities of foodstuffs have been stolen both in France and in Belgium, largely as a consequence of the appalling conditions of the civil population, and that the provision of adequate food-supplies for the civilian population would enable cigarettes to reach our own troops in the front line; also that this conflict between the military and civil situation in France and Belgium is causing the prestige of this country to go down and is interfering with the war effort?—Mr. M. PETHERICK: Does the Minister realise that public opinion is really disturbed here, and that it is quite unnecessary to exaggerate, as everybody understands the difficulties—the

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blown-up bridges all over the Continent and all those kind of difficulties—and could he seek some opportunity of telling the House what is being done?—Mr. ATTLEE: I will consider an opportunity for making a full statement. It is obviously impossible to deal with every point that is made by question and answer. I have stated, and everybody must realise, the difficulties and the effect of them, but that is no reason to make what I venture to say is a too widely-extended statement.

Maternity Services in Glasgow

Major E. G. R. LLOYD asked the Minister whether he intended to continue to permit the Glasgow corporation to remain outwith the provisions of the Maternity Service Act (Scotland) 1937; and was he aware that Glasgow was the only large local authority in Scotland which had not implemented the provisions of this Act.—Mr. JOHNSTON replied: Proposals under the Act which were submitted by Glasgow corporation in September 1939 and which provided for a service of whole-time doctors and midwives were not proceeded with because of difficulties of obtaining staff in war-time. The period for submitting proposals has been extended from time to time and I am extending the period until June 30, 1945. I am, however, in communication with the corporation about their interim arrangements. Two other local authorities have not made arrangements under the Act and in two other areas the local authorities have not been able to bring into operation arrangements which have been approved.

Payments to Pensioners in Hospital

Mr. G. S. SUMMERS asked the Minister of Pensions if he would amend the regulations governing the payment of disability pensions to men still in hospital, so as to enable them to draw the full amount to which they were entitled, after taking account of maintenance charges, thus putting an end to the practice of accumulating sums to be handed over on release from hospital.—Sir WALTER WOMERSLEY replied: I do not share the view that it is undesirable to accumulate a balance for the man's assistance on his discharge from hospital, but in any event there are good medical grounds for limiting the amount of pocket money available to patients under treatment.

Medical Certificates for Coal

Dr. E. SUMMERSKILL asked the Minister of Fuel and Power whether he was aware that medical certificates recommending delivery of coal for people seriously ill were not receiving attention; and if he would take steps to remedy this matter.—Major LLOYD GEORGE: I regret that a number of cases have come to my notice where, notwithstanding instructions, or directions, given by the local fuel overseer, there has been delay in the delivery of coal to cases supported by medical certificates. I have taken steps to ensure that deliveries are made promptly to such cases.

Sick-leave Certificates

Mr. W. FOSTER asked the Minister of Labour if he will consider abolishing the practice by which employers in many districts compel employees to produce medical certificates when off sick for one or more days, for which a charge is made by the doctors, and under which evidence of sickness is not accepted by the magistrates in prosecutions for absenteeism by his Ministry under the Essential Work Orders unless supported by medical certificates, or else relieve employees in such cases of the cost of medical certificates.—Mr. E. BEVIN replied: I have no power to prohibit employers from asking for medical certificates in support of absence. Arrangements have been agreed with employers' organisations, trade unions, and the medical profession under which a certificate in standard form can be obtained for 1*s*.

PRIORITY MILK.—Mr. MABANE estimated the number of people other than expectant mothers and children up to the age of 5 who are entitled to priority supplies of milk as about 9·1 millions.

MEDICAL FILMS.—The film programmes arranged by the Scientific Films Association will take place on the fourth Wednesday (not Thursday) in February, March, April and May, at 1, Wimpole Street, London, W1. Each programme will be given at 5.30 PM and again at 8 PM, and will contain examples of a general-interest introduction, a specialised illustration, a direct teaching film, and a broad discussion of a subject. Application for admission should be made to Dr. S. J. Reynolds, 14, Hopton Road, SW16.

Letters to the Editor

A CHAIR OF PSYCHIATRY

SIR,—In your last issue you announce the decision of the London County Council to separate the chair of psychiatry at London University from the superintendentship of the Maudsley Hospital, and to appoint a director of clinical psychiatry. It is stated that "The new director's appointment, which is to be conditional on concurrent appointment to the university chair, will date from Sept. 1 next." This statement raises two issues, both of importance.

Firstly, is it correct to assume that *all* the cream of the medical profession remains in this country and is available to apply for this post? There are thousands of doctors overseas in the Forces and they include hundreds of psychiatrists. It is reasonable to believe that among them there may be one or even two candidates as good as, or may be better than, any of those of us who are at home. The bulk of Service medical officers overseas can probably not hope for release to civil life until Japan is defeated, which is unlikely to take place before Sept. 1. Does the LCC realise the fund of bitterness that is being stored up among doctors overseas by what they feel to be the filling of important appointments behind their backs? Will the LCC ensure that such doctors have ample opportunity to apply for this post, and that if one of them is selected it will be held open for him until he can be released to civil life?

This leads to the second point. There are only two chairs of psychiatry in the United Kingdom, and the Goodenough Committee, two out of three of whose psychiatric witnesses came from the schools at which these chairs exist, recommended that the responsibility for postgraduate teaching of psychiatry in this country should be restricted to these two schools. Your own leading article of Nov. 25 last echoed the doubt that many of us feel of the wisdom of setting up in this way a narrow psychiatric orthodoxy. Be that as it may, on any count the choice of the new professor in London is of great importance. Your announcement suggests that the LCC is prepared to pay him provided that the University of London accepts their nominee. It seems a curious way of choosing one of the two trustees of British psychiatry, especially in view of the LCC tendency to fill its senior posts from within its medical service. The medical profession has recently made plain its alarm at the possibility of medical practice being controlled by local authorities. There seems to be cause for equal alarm in the possibility of all postgraduate psychiatric education south of the Tweed being put in the hands of the nominee of *one* local authority.

SERVICE PSYCHIATRIST.

A NEW DPM

SIR,—I have read with great interest your annotation of Feb. 3 on the report of the committee on psychological medicine of the Royal College of Physicians. It is encouraging that a body of this nature should set such a high standard for psychological medicine by scheduling a five-years course of training after the necessary medical qualifications and house-appointments.

According to the syllabus as detailed, the first three years is split into varying periods of whole-time study of what may be termed preliminary subjects (anatomy, physiology, pathology of the nervous system, &c.) and short periods of clinical study—three to eighteen months—in various fields such as neurology, psychiatry, and industrial psychology. At the end of this three years the candidate will take his examination; and after this he will spend two years in study at approved institutions of any branch, or branches, of psychiatry or neurology. On completing the last two years to the satisfaction of the examiners he will receive his diploma and be recognised as a specialist. But a specialist in what? One cannot be a specialist in the whole field of psychological medicine, and two years' special study in any one branch is surely inadequate—even though there may be some previous knowledge of the subject—for the high standing which the new DPM should confer.

No mention is made of any psychological examination of the candidate as to his mental fitness for his chosen career. My experience has shown me that quite a

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number of people take up "psychology" either consciously or unconsciously because they hope to find in the work some satisfactory solution for their own internal personal problems. Unfortunately it seldom works out this way; for until the individual has faced and dealt with these problems, they will be a barrier to unbiased understanding of the neurotic patient; and they may even be the precipitating factor which makes the physician resort to mechanical or chemical forms of treatment for his patient instead of pursuing the rational path of treating a psychological patient by psychological methods.

Further, there is no hint in the annotation that the DPM will bear any indication of what branch of psychology the candidate has taken for special study and for which he is presumed to hold the specialist qualification to practise. Unless this is framed specifically, there will be nothing to prevent the man who has taken his DPM in say neurology from practising psychological treatment or taking a post as an industrial psychologist.

Bishops Stortford. D. N. HARDCASTLE.

ALKALI FOR CRUSH INJURIES

SIR,—In the second edition of *War Memorandum* No. 1 recently issued by the Medical Research Council, it is recommended for crush injuries that "all cases should be given sodium bicarbonate 7 gm. (2 oz.) hourly by mouth until the urine turns red litmus blue, but not for longer than 24 hours."

The unfortunate misprint is unlikely to mislead anyone into attempting to give 2 oz. sodium bicarbonate hourly (i.e., about 1·3 kg. in the 24 hours), but we consider that even the dose that the authors intended to recommend, 2 drachms hourly, is excessive and potentially dangerous even if given for only one day. We have drawn attention [1] to the fact that the administration of alkali to patients with kidneys already functionally impaired, as they may be in crush injury, may lead to disaster, and that in some cases even the most vigorous administration of alkali may fail to alkalise an acid urine. Moreover, we have lately found that the administration to normal subjects of only half the dose recommended in the Memorandum may result after 24 hours in retention of sodium and water, indicating that even a normal kidney is unable to excrete alkali at this rate.[2]

The high dosage recommended in the Memorandum is the more surprising since the authors themselves apparently feel that the rationale of the treatment is not yet established. In fact, recent work has shown that there are serious difficulties in accepting the theories on which it is based.[3] We are not prepared to say that alkali in small doses does no good, but we believe that in the doses recommended it is dangerous.

School of Tropical Medicine, Liverpool. B. G. MAEGRAITH. R. E. HAVARD.

AN INDUSTRIAL HEALTH SERVICE

SIR,—I am pleased to find myself in agreement with your leader of Feb. 3 on the plan of the Royal College of Physicians for an industrial health service. The report contains excellent proposals, especially those concerning teaching and research, but it treads on dangerous ground when it deals with administrative problems. Nevertheless, in answer to your suggestion that alternative plans for administration might be put forward, I hereby venture into the quicksands.

The weakness of the RCP's plan lies in its implication that the services are to be controlled by the local authorities through the Ministry of Health, as this is now constituted. That means that factory inspection is to be under the control of local councils, some of whose members are bound to be interested in one way or another in the factories. Instances could be given to support your view that the administration of the Factories Act is "all the better for being divorced from local politics and influence." It would be a retrograde step to give the local authorities control over the factories, even at the risk of spoiling the plan for coördination of all health services, so logically set out in the RCP report.

The logic of the plan falters somewhat when it suggests that the Minister of Health through his chief medical officer should control the industrial health services, the administration of which is to be delegated to the Ministry of Labour and National Service. As you say, it would be much more satisfactory to place all the civilian health services under a single ministry. But what Ministry is to control them? The Ministry of Health in its present form has a local-authority bias, and the Ministry of Labour until recently has been concerned only with employment and kindred problems and not with industrial health. Neither Ministry in its present form is ideally constituted to control industrial health matters. In this connexion it might be added that we are liable to be bluffed by mere words. Just because one Ministry is labelled "health," it does not necessarily follow that it is the repository of all wisdom, knowledge, and experience of health matters; and on the other hand a Ministry called "labour" is not simply on that account the ideal place for the central control of industrial health affairs.

What is the alternative solution? I think that a reformed Ministry of Health is the best place for the administration of industrial health as well as the other civilian health services. But it must be a reformed Ministry. It should be clearly laid down that administration of the Factories Act and the industrial health services should be centrally and not locally controlled. The direction should be in the hands of a joint board composed of the chief medical officer for "local authority" public health, CMO for industrial health, and CMO for Mines, Post Office, and so on. Each of the CMO's might be chairman of the board in turn for a year or other suitable period, and of course each of them should direct his own show. I think that the coördination of the medical services would be better secured in this way than by having one branch dominating the others. Further, the administration should be overhauled to allow medical men to control medical matters, and to eliminate or modify the present lay control. If this were done I firmly believe that the interests of the public and their health would be better secured.

CICERO.

PENICILLIN IN BACTERIAL ENDOCARDITIS

SIR,—The place of penicillin in the treatment of subacute bacterial endocarditis has not yet been established, although encouraging results have been reported in America, and these suggest that prolonged treatment with large doses may be effective in some cases. It is apparent that more information is required on the effective dosage in relation to the sensitivity of the organism to penicillin, and the Penicillin Clinical Trials Committee of the Medical Research Council has therefore established ten centres in which patients will be treated according to a prepared plan, and with full laboratory control. Physicians are invited to refer patients suffering from subacute bacterial endocarditis to any of the following:—

London
(*a*) Sir Alexander Fleming, St. Mary's Hospital, London, W2.
(*b*) Resident Medical Officer Middlesex Hospital, London, W1.
(*c*) Prof. R. V. Christie, Hill End Hospital (St. Bartholomew's) St. Albans.

Liverpool
Prof. Henry Cohen, Department of Medicine, The University, Liverpool, 3.

Sheffield
Prof. E. J. Wayne, Royal Hospital, Sheffield, 1.

Leeds
Dr. J. R. H. Towers 42, Park Square, Leeds, 1.

Manchester
Resident Medical Officer, Manchester Royal Infirmary, Manchester, 13.

Bristol
Prof. C. Bruce Perry, Department of Medicine, Canynge Hall, Whatley Road, Bristol, 8.

Edinburgh
Dr. A. R. Gilchrist, Royal Infirmary, Edinburgh.

Belfast
The Secretary, Belfast Penicillin Clinical Trials Committee, Queen's University Institute of Pathology, Grosvenor Road, Belfast.

RONALD V. CHRISTIE, Secretary, Penicillin Clinical Trials Committee.

1. Maegraith, B. G., Havard, R. E. *Lancet*, 1944, ii, 338.
2. Report to Malaria Committee, Medical Research Council, No. 38. December, 1944.
3. Foy, H., Altmann, A., Barnes, H. D., Kondi, A. *Trans. R. Soc. trop. Med. Hyg.* 1943, **36**, 197.

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EXUDATIVE TONSILLITIS

SIR,—As Dr. Clarke observes in your last issue, I had not read Neubauer's paper on clinical signs of diphtheria in inoculated children (*Lancet*, 1943, ii, 192). My attention was afterwards drawn to it, but I am bound to say that, having read it carefully, I am not fully convinced that diphtheria in an immunised child may manifest itself as a follicular tonsillitis.

I have rearranged the list of the 49 cases of diphtheria in Dr. Neubauer's paper as follows:—

Throat lesion	No. of case	Fœtor	Glands	Œdema	Nasal discharge	Complications
(*a*)	3	..	1	..	1	None
(*b*)	9	1	3	..	..	8 none. Myocarditis 1
(*c*)	7	..	..	..	..	6 none. Peripheral neuritis 1
(*d*)	11	5	7	7	1	9 none. Peripheral neuritis 2
(*e*)	9	5	6	..	1	None
(*f*)	10	6	4	4	2	Paralysis 2. Peripheral neuritis 1. Myocarditis 5

Although it will be necessary to refer to the original article for a proper understanding of the position, categories (*a*) and (*b*) include cases of what would be regarded clinically as follicular tonsillitis. What evidence is there that they suffered from diphtheria? Fœtor, glands, and nasal discharge are somewhat equivocal signs. One patient admittedly developed myocarditis, but myocarditis is not exclusive to diphtheria: for example, streptococcal tonsillitis, acute rheumatism, and influenza may give rise to this complication. At the other end of the list (*f*), the clinical findings and the complications are in conspicuous contrast, and the diagnosis of diphtheria could not be questioned.

I feel that in all this there is a principle at stake. If we are to accept as diphtheria every child with follicular tonsillitis who happens to have a positive swab, we are playing into the hands of those who, for reasons best known to themselves, attempt to decry diphtheria immunisation. If it can be proved that, in an immunised individual, infection by the *Corynebacterium diphtheriæ* leads to the production of a follicular exudate instead of membrane, we must accept that. But, as I said before, I am not yet convinced.

W. ALCOCK,
Burton-on-Trent. Medical Officer of Health.

A FACULTY OF OPHTHALMOLOGISTS

SIR,—As chairman of the organising committee of the Faculty of Ophthalmologists I have been asked to write a reply to Mr. Lionel Green's letter.

Mr. Green's criticisms of the Council of British Ophthalmologists and its activities contain many inaccuracies. The origin and constitution of that body were stated in the preamble to the announcement of the formation of the Faculty published in your issue of Feb. 3. Mr. Green states that the CBO has had a purely nominal existence unknown to the mass of ophthalmologists. This statement shows a surprising ignorance of the facts. Every member of the Ophthalmological Society of the United Kingdom, which has between 500 and 600 members, has received each year, with only two exceptions early in the present war, a notice of a meeting, open to all ophthalmologists, to receive and discuss the annual report of the CBO. His statement implies, therefore, that the "mass of ophthalmologists" are not members of the leading scientific ophthalmological society in the country!

The annual reports, and a very large number of special reports, have been published in the *British Journal of Ophthalmology*; so one must assume that Mr. Green's "mass of ophthalmologists" do not read the journal devoted to their specialty.

Had Mr. Green heard or read these reports he would have learned that the CBO has had a far from purely nominal existence, and, among many other activities, has played a leading part in negotiations with the Government with regard to optical benefits under the National Health Insurance Act, and in opposing the attempts of sight-testing opticians to obtain statutory recognition.

He is quite mistaken in supposing that a resolution passed by the council of the Association of British Ophthalmologists had anything whatever to do with the initiation of the plan for the formation of a Faculty. Many members of the CBO had long felt that some change in its constitution was advisable, and proposals were under discussion as early as the summer of 1942. In March, 1943, the CBO appointed a committee to study the question and prepare a scheme for reform or reconstitution. This committee was given power to coöpt any persons whose collaboration it considered would be useful. It decided to obtain, if possible, the coöperation of the ABO, and therefore invited the council of that body to send representatives to its meetings. Several meetings were held with these representatives, and although a considerable measure of agreement was reached, negotiations finally broke down when it became apparent that the ABO would not accept any scheme which ensured that a majority of the executive council should be elected by persons of real consultant status, a condition which the CBO considered of vital importance.

London, W1. W. H. MCMULLEN.

DECOMPRESSION FOR RETENTION

SIR,—I read with great interest Mr. Cox's paper of Feb. 3 on bladder decompression and its control by cystometric pressure readings. He recommends as an ideal "flexibility of decompression based on the intravesical pressure." I would submit that this has been attained for many years by the simple method of decompression, based essentially on cystometry, which I first learnt in Newcastle-on-Tyne from Prof. R. J. Willan. It is eminently satisfactory in practice, and consists in attaching a sterilised rubber tube and U-shaped glass tube to an indwelling catheter and hooking the inverted U-tube over the side of a can which is attached to a vertical stand at the bedside. By adjusting the height of the can the rate of flow of urine can be controlled as desired. Such an apparatus is the equivalent of a constantly attached cystometer, and in these days has the added advantage that it is easy for the overworked nursing staff to control.

London, SW17. HENRY K. VERNON.

DIAGNOSIS OF PRIMARY CANCER OF THE LIVER

SIR,—In a recent article on cancer of the liver in the negro in Africa and America, Professor Kennaway [1] drew attention to the fact that "primary cancer of the liver is at the best a bad subject for mass statistics, on account of the danger of inclusion of metastases from undetected primary tumours elsewhere." Observations which I made several years ago may be of interest in this connexion, suggesting a possible method of differentiating during life between primary and secondary tumours of the liver.

In a study of the lactic acid content of the blood in normal subjects and those suffering from different diseases including cancer [2] (using the methods of Friedemann et al.[3] and of Mendel and Goldscheider [4]), normal values (9–15 mg. per 100 ml.) with occasional variations not exceeding 100% were obtained in most of the diseased cases studied, including cancer cases, some of them with extensive metastases in the liver. The only exceptions were 3 cases of primary carcinoma of the liver (confirmed at autopsy), which gave values 5–10 times the normal (60–130 mg. per 100 ml.) on repeated examination. Similar examination of the urine in 2 of the cases indicated also an increased excretion of lactic acid.

While the small number of primary cancers of the liver encountered in a European community prevented a more extensive follow-up of the problem, the striking

1. Kennaway, E. L. *Cancer Res.* 1944, **4**, 571.
2. Schöntal, R. *Polska Gaz. lek.* 1938, **17**, 1011.
3. Friedemann, T. E., Cotonio M., Shaffer, P. A. *J. biol. Chem.* 1927, **73**, 335.
4. Mendel, B., Goldscheider, I. *Klin. Wschr.* 1925, **4**, 1502.

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results obtained suggested the possibility of the method being useful as a differential test.

The work was carried out at the university clinic connected with cancer laboratories in Cracow. The results were published in a Polish medical journal which is unfortunately not available here.

British Empire Cancer Campaign Research Centre, Sir William Dunn School of Pathology, Oxford. REGINA SCHOENTAL.

SAFETY IN THE HOME

SIR,—Your note of Feb. 3 on home accidents was indeed timely. There is no doubt that far too little attention has been given to accident prevention in that most important of all workshops—the home. As you point out, the remedy lies in the dual approach of education and the provision of better conditions.

Your suggestion that little is done to educate people about safety measures in the home is perhaps hardly just to the National Home Safety Committee of the Royal Society for the Prevention of Accidents, which, centrally and through a number of area committees, has for some years, despite limited resources, endeavoured to maintain a propaganda campaign. By poster and pamphlet, press articles and broadcast talk, lecture and conference, the urgency of the question is stressed, and now attempts are being made to use the film as an ally in the campaign.

What is needed is more support for the work. The committee are especially anxious to secure the goodwill of medical officers of health, who have in the machinery of their departments such excellent means of reaching the mothers. Talks in clinics, infant welfare centres, and the like have been found most useful, and the more they are multiplied the greater the chance of reducing this disastrous toll.

Royal Society for the Prevention of Accidents, Grosvenor Gardens, London, SW1. ETHEL WILLANS, Chairman, National Home Safety Committee.

Public Health

Milk in Cartons

WELL over 90% of the liquid milk sold to the domestic consumer in this country reaches him in glass bottles. At a recent meeting of the Society of Dairy Technology,[1] the important question of the standardisation of the milk bottle was discussed. As is well known, there is wide variety of shapes, sizes, and types of bottle. This variety complicates to an unnecessary degree the processes of filling and the making of bottle-filling machines, the type and method of closure of the bottle, its packing for transport, and its washing and sterilising, and in so doing adds a gratuitous tax, borne ultimately by the consumer, to the price of liquid milk.

At this meeting it was thought that much advantage was to be gained in reducing the number of existing sizes of bottles and by standardising each size. A type of closure completely covering the mouth of the bottle was recommended, and other suggestions were made which are now being considered by the Dairying Industries Committee of the British Standards Institution.

The total number of milk bottles in circulation at any one time must run into scores of millions. The commonest size, the pint bottle, weighs 18–20 oz.; so the distribution of 20 oz. of milk means that an extra weight about equal to the weight of the liquid itself has to be transported to the consumer's house and later carried back to the distributor's premises.

The drawbacks of the milk bottle are manifold. Initially heavy and costly, requiring to be recovered after use from the consumer, needing special machinery which, in the large-scale distributing dairy, is of vast size and complexity and requires skilled and constant supervision to obtain regularly hygienic results, calling for care in handling to avoid an unduly large proportion of breakages, it also has the disadvantage from the distributor's point of view of being of a convenient size and shape for many alternative uses in the household.

Why has not the non-returnable carton superseded it? Does the huge investment of capital already made by our major dairies in bottles, bottling and bottle-washing machinery, crates and containers to fit the bottles, inhibit a change which would mean scrapping of much valuable plant and an outlay, by no means negligible, for cartonning machinery? The modern waxed paper carton is relatively cheap, very light in weight, but strong and almost sterile; it needs no costly recovery service, no machinery for cleansing, and when dried it makes an excellent firelighter! It is said to be easier to measure with exactness the quantity of milk delivered into a carton than into a bottle. Whilst the colourless glass bottle gives little protection against the steady destruction by light of the vitamin C in the milk contained in it, the carton gives greater, though still not complete, protection.

We cannot give the complete answer to these questions, some of which are touched upon in a recent commercial publication.[2] Perhaps the cost of the tough modern bottle divided by the surprisingly large average number of journeys—said to be 40 to 80—that it makes, is so small as to outweigh economically the apparent advantages of the single-journey carton. Reduction in the number of bottle sizes and standardisation of shapes and types might, if carried out, still further strengthen the relative position of the bottle. From the housewife's point of view the transparent bottle has also the advantage of showing a "cream line," that popular though dubious indication of the "richness" of the milk. In war-time, allocation of the imported raw materials, especially paraffin wax, needed for extensive carton manufacture may be difficult or impossible, whereas materials for glass manufacture are nearer home.

Presumably the carton manufacturer is continually experimenting with cheaper but equally tough types of paper, with more economical methods of impregnation, with various impregnating agents which have no effect on milk flavour, and with efficient and cheap sealing materials. When after the war the necessary materials are available in sufficient quantity and quality, it will be desirable to try a really large experiment, possibly in several areas, to ascertain the relative costs of milk distribution by bottle and by carton. Attention should at the same time be paid to the possible advantages of pasteurising and packing milk at country depots near the farms instead of sending it in bulk to pasteurising depots in the large cities. This can be done if cartons are used instead of bottles, and it is more than 13 years since London medical officers of health were given an impressive demonstration by Bladen Dairies in Dorset.[3]

Even during the war a particularly good case can be made out for the use of cartons in the distribution of tuberculin-tested (or tuberculin-tested pasteurised) milk by a producer-retailer who wishes to avoid the complication and hygienic difficulties of handling bottles on a relatively small scale.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED FEB. 3

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1401; whooping-cough, 1502; diphtheria, 415; paratyphoid, 2; typhoid, 4; measles (excluding rubella), 16,039; pneumonia (primary or influenzal), 1366; puerperal pyrexia, 130; cerebrospinal fever, 76; poliomyelitis, 5; polio-encephalitis, 1; encephalitis lethargica, 1; dysentery, 376; ophthalmia neonatorum, 67. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Jan. 31 was 1014. During the previous week the following cases were admitted: scarlet fever, 31; diphtheria, 20; measles, 93; whooping-cough, 28.

Deaths.—In 126 great towns there were no deaths from enteric fever or scarlet fever, 11 (0) from measles, 13 (3) from whooping-cough, 4 (0) from diphtheria, 66 (4) from diarrhœa and enteritis under two years, and 89 (8) from influenza. The figures in parentheses are those for London itself.

Birmingham reported 7 deaths from diarrhœa. There were 3 fatal cases of whooping-cough at Liverpool.

The number of stillbirths notified during the week was 199 (corresponding to a rate of 29 per thousand total births), including 14 in London.

1. *Dairy Industries*, 1944, 9, 720.

2. The Nation's Milk. With a foreword by Lord Perry. Perga Ltd., Gateshead. 2*d*.

3. *Lancet*, 1931, ii, 1086.

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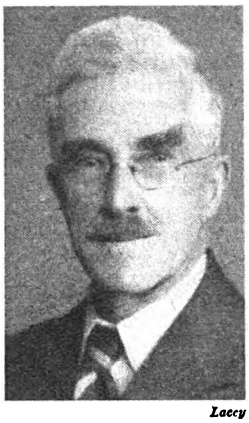
Obituary

SAMUEL ERNEST GILL

M D LOND., D P H

MOST of Dr. Gill's life was spent in the care of mental defectives. After qualifying from St. Bartholomew's Hospital in 1893 he held a house-appointment at Birmingham, was resident medical officer at the Royal Chest Hospital, and went to sea as a ship's surgeon. Then he settled in general practice in Nottingham, and became assistant physician to the General Hospital. But he was soon engaged in school work as medical inspector for the local education committee, and it was this that led to his investigation of mental defect undertaken for the Royal Commission on the Care and Control of the Feeble-minded, which reported in 1908. After working for a time as the first medical superintendent of Farmfield certified institution, he became a medical inspector, and later a commissioner, of the Board of Control. When he retired he accepted, in 1934, the post of medical director of the Guardianship Society, founded at Brighton by Miss Woodhead. The Royal Commission had recommended that mental defectives should "at an early age be brought into touch with some friendly authority, trained, and as far as need be, supervised during their lives, in coöperation with their relations, when that is to their advantage." This was the aspect of their care to which Gill devoted his later years. He was an enthusiastic believer in "boarding-out," with its individual approach, for suitable defective children, and despite poor health he worked courageously till his death at the age of 74 on Feb. 2. He wrote a first-rate pamphlet entitled *Some Notes on Mental Deficiency Practice*, and he was a valued collaborator of the Central Association for Mental Welfare.



Lacey

Gill had bright-blue eyes, reddish hair, and a gentle pleasing voice. Coming of a Quaker family, "he was a Friend in more ways than one, and all who worked with him will remember his courteous, happy, but self-effacing manner, his ready interest and desire to help those in need." He leaves a son, serving in the Royal Air Force, and a daughter who is a lecturer on institutional management.

MARY KATHLEEN FORSAITH KITCHIN

M B, M SC LOND.

THE LANCET loses a valuable contributor, and the profession a gifted member, by the death of Mrs. Kitchin at the early age of 47. In medical journalism she was always a free-lance, but it was for many years one of her chief occupations, and she was one of its most competent practitioners. To this as to her other pursuits she brought a good brain trained in several different disciplines, and experience of half a dozen different kinds of work.

Her first choice was anatomy. Coming to the London School of Medicine for Women from the Wimbledon High School, Kathleen Lander became demonstrator in that subject (1917–18), and took her MSc Lond. in it. In the last year of the last war she was honorary acting prosector at the Zoological Gardens, and she produced papers on the morphology of the pectoralis minor, the anatomy of the takin, and maceration by tryptic digestion. She graduated in medicine from St. Mary's Hospital in 1921, was given a Beit fellowship for research on the evolution of stereoscopic vision and conjugate movements of the eyes, and for a time was assistant curator of the Wellcome Historical Medical Museum. The next few years were largely clinical: she had a general practice in Camden Road and an infant-welfare clinic in Mile End, and was on the staff of the Tavistock Clinic. But more and more she devoted her energies to annotations, abstracts, and reports for the medical press, and in 1925 she spent some months in THE LANCET office as a locum. Her husband, Mr. D. Harcourt Kitchin, is a barrister, and at the time of their marriage was acquiring the medical background that has made him expert in medicolegal affairs. Together they formed a kind of literary agency which could overnight provide an accurate and well-informed report on almost any subject, and their services were invaluable not only to medical editors but to harassed authors needing technical help in preparing books and papers.

Useful as it was, however, such work could not permanently satisfy Dr. Kitchin, and in the last ten years it had become only a side-line. Since well before the war almost her only reports for this journal have been her accounts of the proceedings of the General Medical Council—which reveal her talent for concise narrative but give no hint of her vigorous disapproval of parts of the council's penal procedure. Almost a lawyer by marriage, she sought a legal qualification and was called to the bar at Gray's Inn; but her practice remained mainly psychotherapeutic, being based on experience as a clinical assistant at Bethlem Royal Hospital, and at the Maudsley, as well as at the Tavistock Clinic. In 1937 she joined the executive committee of the Guild of Pastoral Psychotherapy. "I am," she wrote, "in no sense a promoter of the movement; it arises wholly within the ranks of the clergy. . . . We were concerned only to help the clergy to do that work which is properly done, and has in the past been done, in the vestry and study. There is not the slightest desire to encourage the clergy to undertake work which properly belongs to the consulting-room or clinic."

The last of Dr. Kitchin's hospitable and stimulating homes was a house—left her by a relative—at Aldbourne in Wiltshire, where for a time she was psychologist to the county council. With the years, she was perhaps less easily moved to righteous indignation, but remained cheerful and witty as ever, and grew even more versatile in rural activities. Though much of her work was still done in London, from a second house on Wimbledon Common, the country was where she preferred to be; and it was there she died, after a month's illness, from pneumonia on Feb. 5.

EDWARD STANLEY ROBINSON

MRCS

Dr. E. S. Robinson, who died at Stourport on Feb. 2 at the age of 79, was born at Leicester, the son of George and Sarah Robinson. On the death of his father, the small family removed to Stourport and lived for many years in Lombard Street in what is now the Workman's Club, and it was from here he proceeded to the London Hospital, where he qualified in 1888. For some years he travelled round the world as a ship's surgeon, but in 1897 he married Miss Margaret Baldwin Worth, and set up practice at York House, Stourport, where he lived until his retirement in 1939.

As a former MOH for Stourport he had presided over the Midland branch of the Society of MOHs, and one of his chief interests was the Lucy Baldwin Maternity Home, which he served for many years. His life as a family doctor was full, unselfish, and happy. He served his fellow men and his reward was trust and affection.

ROBERT FENNER

MRCS

Dr. Robert Fenner, who died at the age of 85 in December last at Liphook, was one of the most popular practitioners in London, where he was in practice until he was 80.

Fenner was born at Greenwich in 1859 and after passing a preliminary examination with honours, became a student at King's College Hospital, where he was dresser to Lord Lister. After being qualified at the age of 21, he spent two years as assistant house-surgeon at the Salop Infirmary, and afterwards as medical officer to the copper mines at Betts Cove and Tilt Cove, Newfoundland. During his work there he was made a fellow of the Royal Geographical Society. On his return to England he married his first wife, Edith Carter, and went to Cromer, where he was in practice for many years and where his two sons and daughter were born

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and his wife died. He took into partnership Dr. Herbert Dent, who became a lifelong friend. Dr. Fenner was one of the original founders of the Cromer golf-club.

After leaving Cromer, where he had many celebrated patients, among whom were the Empress of Austria, King Edward VII, and Winston Churchill (then a boy of twelve), Dr. Fenner came to London in 1897, where he lived in Spanish Place. For many years he was in partnership with the late Sir Morice Abbot-Anderson in Birchin Lane, where he held appointments as medical officer to the City banks and insurance companies. In 1898 he accompanied the late Kaiser William II and the Empress on their tour in Palestine.

During the last war he retired from his City practice and continued as a consultant at Spanish Place. In 1917 and 1918 his two sons were killed, and his daughter died. His second marriage was in 1925 to Barbara Murray-Smith. He continued in practice in Upper Brook Street and afterwards at Hertford Street until the present war, when he had to leave London. He lived for a time on the South Coast and for the last eighteen months at Liphook.

"Bob" Fenner, as he was affectionately called, was a keen yachtsman and at one time owned the yacht *Chough*. He was a member of the Royal Thames Yacht Club, the Reform Club, and the City Carlton. He was an all-round sportsman and in his younger days an enthusiastic rugger player and rowing man. He retired as major in the militia battalion of the Royal Fusiliers and during the last war was chief constable of the Marylebone police volunteers and head of the Thames police patrol. H.

CORRIGENDUM.—In the last sentence of the notice of Mr. Harrison Butler appearing last week it should have been stated that his younger son succeeded him as honorary surgeon to the Birmingham and Midland Eye Hospital (not house-surgeon as printed).

Births, Marriages, and Deaths

BIRTHS

ACKNER.—On Feb. 8, in London, the wife of Flight-Lieutenant Brian Ackner, RAFVR—a daughter.
APLEY.—On Jan. 22, the wife of Mr. A. Graham Apley, FRCS, Shillingford, Exeter—a daughter.
BOWLBY.—On Feb. 9, at Broad Chalke, Salisbury, the wife of Lieut.-Colonel John Bowlby, RAMC—a daughter.
DAVENPORT JONES.—On Feb. 4, at Bournemouth, the wife of Major I. Davenport Jones, RAMC—a son.
DAVIDSON.—On Dec. 31, at Carlisle, the wife of Captain T. K. Davidson, RAMC—a son.
DENNY.—On Feb. 8, at Plymouth, the wife of Surgeon Lieut.-Commander G. C. Denny, RN—a daughter.
LLOYD.—On Feb. 4, at Ross-on-Wye, Dr. E. Jean Lloyd (née Thomas), the wife of Dr. Marner Lloyd—a daughter.
MULLER.—On Feb. 8, in London, the wife of Surgeon Lieutenant Christopher Muller—a daughter.

MARRIAGES

CAIRNS—WRIGHT.—On Jan. 25, at Bradford, Gordon David Cairns, major RA, to Marcia Jean Wright, lieutenant RAMC.
CHANCE—BIRKMYRE.—On Feb. 10, in London, Clifford Chance, MC, MB, to Sheila Birkmyre (née Kempster).
HEYDON—DANBY.—On Feb. 8, at Sutton, Bernard Louis Francis Heydon, MD, to Kathleen Norah Danby.
POWELL—TRENCH.—On Feb. 3, at Wandsworth, H. Denis W. Powell, MB, to Leonore Elisita Trench.
RUTHERFORD—MICHAUD.—On Jan. 20, at Port Said, Raymond Denys Rutherford, major RAMC, to Simone Michaud.
WOODSEND—COOKE.—On Feb. 8, at Catterick, Yorks, Gervase Woodsend, MRCS, to Katharine Frances Cooke.

DEATHS

ALLAN.—On Feb. 4, at Tunbridge Wells, Alexander Smith Allan, MB GLASG., DTM.
EATON.—On Feb. 3, at Lanark, Ernest Milne Eaton, MD GLASG., FRFPS, DO, formerly of Blackpool.
GILBERT.—On Feb. 2, at Emsworth, Charles William Gilbert, MRCS, Havant, and Albany, Australia, aged 74.
HOWARD.—On Feb. 4, at Oxford, Vincent Howard, MRCS, aged 75.
KINLOCH.—On Feb. 5, Robert Blair Kinloch, MB LOND., of St. Albans, aged 69.
LYNN ALLEN.—On Feb. 5, at Kingston Deverill, Warminster, James Lynn Allen, MB CAMB., formerly of Liphook, Hants.
MCKENDRY.—On Feb. 3, at Westcliff-on-Sea, Thomas Torrens McKendry, MB RUI, aged 82.
RITCHIE.—On Feb. 7, at Edinburgh, William Thomas Ritchie, OBE, MD EDIN., FRCPE.
STANLEY.—On Feb. 7, at Thirfield St. Michael's, near Tenterden, Kent, Edmund Hamilton Blake Stanley, MRCS, lieut.-colonel IMS retd., aged 69.
WALLIS.—On Feb. 6, at Worthing, Charles William George Robinson Wallis, BA OXFD, MRCS, aged 86.
WYLLYS.—On Feb. 4, William Wyllys, MRCS, formerly of Great Yarmouth, aged 73.

Notes and News

THE DISPLACED

IT has been estimated that somewhere about 20 million people have been displaced by the German methods of governing Europe. General Eisenhower, supreme commander of the Allied Military Forces in Western Europe, and Mr. H. H. Lehman, director-general of UNRRA, have now agreed that teams of UNRRA workers should act with the Army in coping with these homeless people. Each team will have about 12 members including a director, a supply officer, a medical officer, a nurse, welfare workers and clerks. It is hoped that many members of the teams can be recruited from among the refugees themselves. The UNRRA workers will be civilians, but while coöperating with the Army they will wear uniforms and, as in other civilian services, be subject to general military discipline. They will be attached to appropriate military staffs under the Displaced Persons branch of G 5 or the Civil Affairs branch of SHAEF, which is a military organisation dealing with civilians in their contact with the Army. Most of the work will probably have to be done in Germany, but at the request of the governments concerned teams will also be sent to the liberated territory of friendly nations.

OVER A CUP OF TEA

A VERY large tea-party gathered in London on Jan. 30, at the invitation of Foyle's Book Shop, to hear a talk on Doctors by Dr. Charles Hill, secretary of the British Medical Association.

He spoke of the doctor's traditional relations with his patients. In this mutual contract, he said, the doctor is chosen by the patient and owes loyalty to no-one else; and the patient is better able to judge the merits of his doctor than any committee in the town hall. He pointed to the dangers of dividing the doctor's loyalty, as might happen under a national medical service. The doctor would naturally feel a duty towards the body that paid him, whatever that body might be: he would no longer be answerable to the patient alone. Again, a national service might interfere with free choice of doctor; and though this was sometimes said to be merely a formal objection he believed it to be a real and serious one. He discussed the fate of the voluntary hospitals, setting out the danger in which they would stand if the proposals relating to them in the white-paper were fulfilled. While there are good and bad voluntary hospitals, it would be a great misfortune if all such hospitals, whatever their standard, were relegated to a status inferior to that of the municipal hospitals. This must happen, he felt, if they were to be financed on the lines laid down in the white-paper.

He emphasised the dangers of bad housing, which have been blamed, he said, for the deaths each year of 15,000 children under five. The betterment of housing, he thought, might well claim the country's energies as a primary reform. He noted that most people are not health-minded but disease-minded, their conversation dealing with two periods—before my operation and after my operation. People should find an interest in good health, and children at school should learn the normal working of the human body. He advocated larger research grants. The Government, he said, allot £250,000 a year to research—only one-tenth of 1% of the estimated cost of disease. He suggested that they should allocate £2 million to research on rheumatism alone.

MANY KINDS OF SERVICE

THE Friends' Ambulance Unit offers a wide range of experience to its members, as the fifth annual report [1] demonstrates. Orange stars on a map of the old world show them to be scattered from the far shore of China in the east to Morocco in the west, and from Ethiopia in the south to Scandinavia in the north. They are helping to staff field surgical units in France, Belgium, and Holland, to maintain and move a mobile hospital, and to relieve civilians in Italy; they are working in UNRRA camps for Yugoslav and Greek refugees; they are running clinics in Syria and hospitals in Ethiopia; they have helped to fight famine in India and to transport supplies in China. Some of those remaining at home have volunteered as subjects for medical research. It takes courage to agree to having a cardiac catheter passed.

1. Obtainable from the FAU, 4, Gordon Square, London, WC1.

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MINIATURE RADIOGRAPHY IN LANCASHIRE

A FIRST report on the results of mass radiography has been made to the Lancashire county council by the county tuberculosis committee. The three surveys made covered the staff of a mental hospital, the employees of a large industrial undertaking, and the employees of an Ordnance factory—10,730 people in all. Subjects were examined voluntarily, the results were confidential, and no action was taken without the consent of the person concerned. Of 873 in whom abnormalities were found, all except 31 accepted an invitation to have a full-size film taken.

Abnormal findings could be classified as follows: abnormalities of the lungs and bony thorax, 57; chronic bronchitis and emphysema, 45; non-tuberculous bronchopneumonia, 1; bronchiectasis, 17; non-tuberculous fibrosis, 35; pneumoconiosis, silicosis, asbestosis, 7; basal fibrosis, 39; pleural thickening, 16; non-tuberculous effusion, 5; cardiovascular lesions, congenital 8, acquired, 54; tuberculosis, active 36, inactive 401; miscellaneous conditions, 19.

Of the 36 cases of active tuberculosis (3·3 per 1000 examined), 12 had positive sputum (1·1 per 1000). Sanatorium treatment was accepted by 26, 6 were placed on the dispensary register for supervision, 2 were referred to their own doctors, and 2 refused treatment. Judging by these results, and reckoning that there are half-a-million people working in factories in the whole administrative county, the writers of the report estimate that there are some 500 undiscovered cases with positive sputum in this population section. Mass radiography provides the means for their detection at a time when the chance of successful treatment is good.

A PLAN FOR BATH

AN exhibition is in progress at the Victoria Art Gallery, Bath, illustrating a plan for the next fifty years prepared by Sir Patrick Abercrombie, FRIBA, and the city's engineer and town-planning officer. It is based on a "community of Bath" consisting of 14 "neighbourhoods" and 13 parishes or parts of parishes fringing the present city boundary. An increase of population from 78,500 to 81,000 is allowed for. An area almost as large as the ancient Roman town is set aside as a health centre which will have spacious gardens and will include the Royal National Hospital for Rheumatic Diseases, accommodation for research, and hostels. The development of this area as a centre of healing and combat against rheumatism is described as "the finest gesture of modern Bath to the world." The city's "healing waters are to be made available to the greatest number of people at the lowest cost."

ORANGE-JUICE JELLY

THE Minister of Education, after consulting with the Minister of Food, is providing school canteens and residential schools with a limited quantity of orange-juice jelly. The vitamin-C content of the jelly will vary with that of the orange juice of which it is made, and the time it has been stored. The average potency expected is 17 mg. of vitamin C per oz. and the minimum potency (declared on the labels) will be 12 mg. The Minister wisely notes that the jelly is popular with children so long as it is not served too often; about an ounce a week is thought to be a suitable dose. It tastes strongly of orange, and can be used like marmalade. The cost is expected to work out at about ½d. per child per week. A number of appetising receipts are proposed for its use.

Royal College of Surgeons of England

At a meeting of the council held on Feb. 8, with Sir Alfred Webb-Johnson, the president, in the chair, Mr. Ernest Finch, of Sheffield, was elected a member of the court of examiners for three years. The Association of Municipal Specialists was admitted to the joint secretariat under the auspices of the college at No. 45, Lincoln's Inn Fields. Mr. McAdam Eccles was reappointed a representative of the college on the British Social Hygiene Council for 1945.

Diplomas of membership were granted to Diana M. Beyts; R. M. Laslett, W. D. G. Tellam, and to the candidates named in the report of the comitia of the Royal College of Physicians in our issue of Feb. 3, p. 165 (with the exception of R. A. Allen, F. Z. L. B. James, H. B. Marsden, and J. Sharp).

Royal College of Physicians of Edinburgh

At a meeting of the college held on Feb. 6, with Dr. A. Fergus Hewat, the president, in the chair, Dr. W. F. T. Haultain, took his seat as a fellow. Dr. D. R. Maitland (Cupar, Fife) and Dr. Ian Douglas-Wilson (Harrogate, Yorks) were elected to the fellowship.

Dr. W. T. RITCHIE, formerly president of the Royal College of Physicians of Edinburgh, and emeritus professor of medicine in the University of Edinburgh, died on Feb. 7. He was in his 72nd year.

University of Sheffield

Mr. E. F. Finch, FRCS, has been appointed honorary lecturer in the history of medicine, Dr. W. J. W. Sharrard temporary demonstrator in anatomy, Dr. J. Carson honorary lecturer in psychology, Dr. C. H. Rosenberg tutor for diseases of children.

Royal College of Physicians of Ireland

At a meeting held on Feb. 2 Dr. R. H. Micks was elected King's professor of materia medica and pharmacy. The following were admitted licentiates and members of the college: Dr. J. D. Kennedy, Dr. Anne McMahon, Dr. W. E. O'C. C. Powell, and Dr. Robert Wilson.

Post-war Smoke Abatement

The Institute of Fuel and the National Smoke Abatement Society are holding a joint conference on this subject in London on Feb. 23, when Major Gwilym Lloyd George, MP, the Minister of Fuel and Power, will be the opening speaker.

British Council Meetings at Birmingham

Dr. J. F. Brailsford is giving a series of talks at the University Overseas Club, 5, Great Charles Street, Birmingham, 3, on Sundays at 7.30 PM. He is speaking on diseases of the bones and joints and on Feb. 18 he will discuss deficiency diseases, on March 4 trauma, on March 18 inflammatory conditions, on April 15 simple tumours, and on April 29 malignant tumours.

Royal Sanitary Institute

At a meeting to be held at Radiant House, Bold Street, Liverpool, on Saturday, Feb. 24, at 10.30 AM, Dr. C. O. Stallybrass will speak on public health and the social services.

Nutrition Society

On Saturday, Feb. 24, at 11 AM, at the London School of Hygiene, Keppel Street, WC1, the society is holding a conference on factors affecting the nutritive value of bread as human food. Dr. R. A. McCance and Miss E. M. Widdowson, PH D, are speaking on percentage extractions and composition of flours, Miss Harriette Chick, D SC, and Miss A. M. Copping on the nutritive value of different types of flour, Mr. D. W. Kent-Jones, PH D, on enrichment, Prof. H. D. Kay, D SC, on the value of wheat offals for milk production, Mr. E. T. Halnan on the value of wheat offals for pigs and poultry, and Prof. J. A. S. Watson on the best use of wheat for man's needs.

Royal Society of Medicine

The section of pathology is holding a laboratory meeting at the London Hospital, E1, on Tuesday, Feb. 20, at 4.30 PM. On Feb. 21, at 1, Wimpole Street, W1, at 2 PM, at the section of comparative medicine, Mr. H. T. Matthews, Dr. W. A. Lethem, and Mr. Clyde Higgs will open a discussion on the veterinary and medical control of the milk-supply. On Feb. 22, at 5 PM, at the section of urology, there will be a discussion on the radiotherapy of tumours of the kidney and bladder, when Air, Commodore Stanford Cade and Mr. G. F. Stebbing will be the opening speakers. On Feb. 23, at 3 PM, at the section of epidemiology and state medicine, Colonel P. G. Stock will speak on the International Sanitary Conventions of 1944. On the same day, at 4.30 PM, at the section of disease in children, Prof. Robert Debré will describe the condition of children in France under the occupation.

LEWIS'S LIBRARY.—Messrs. H. K. Lewis (136, Gower Street, London, WC1) have published a new edition of the catalogue of their library, revised to the end of 1943. The volume will cost subscribers 12*s*. 6*d*., but others will have to pay 25*s*.

Appointments

ANSELL, ISAAC, MB LPOOL, MRCP: asst. physician, Liverpool Hospital for Consumption.
CLARKE, J. A., MRCS: RSO, London Jewish Hospital.
FORSTER, T. W., MRCS: temp. asst. MO and school MO for Barking.
HULL, E. R., MB BELF., DPM: medical superintendent, Royal Eastern Counties Institution for Mental Defectives, Colchester.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

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AVIATION MEDICINE*

SIR HAROLD WHITTINGHAM
KCB, KBE, M B GLASG., LL D, F R C P, K H P
AIR MARSHAL; DIRECTOR-GENERAL OF MEDICAL SERVICES, ROYAL AIR FORCE

BEING naturally interested in the great American doctor in whose illustrious name I am being honoured on this occasion, I find, from studying his record, that John Jeffries of Boston is an example of a type which never fails to emerge in American history—a man of vision, a modernist much in advance of his time, as were Benjamin Franklin and Abraham Lincoln.

John Jeffries throughout his life had close ties with England and Scotland. He studied under that world-renowned surgeon John Hunter, and he obtained the degree of doctor of medicine at Aberdeen University in 1769, being the first American to receive this distinction. From 1771 to 1774 he served as assistant surgeon in a British Navy ship and at a naval hospital ashore. He then saw service in British military hospitals in America from 1775 to 1779, and later with British troops in action at Savannah and Charleston. Doubtless, had an Air Force existed then he would have served with it also; probably it would have been his first and last love.

Settled for some time in England after the War of Independence, Jeffries, a keen meteorologist, was the first medical man to study aviation medicine. In November, 1784, at his own expense, he made a balloon ascent over London with the French aeronaut, Monsieur Jean Pierre Blanchard; by this means was obtained the first record of scientific data of free air at 9000 feet above sea-level. It can also be claimed that John Jeffries was the first man to drop leaflets from the air, having received the quaint notion of dropping greeting cards to his many admirers below, during his flight over London.

In January, 1785, Jeffries and Blanchard made their epic balloon flight across the English channel, reaching the coast of France within two hours, after jettisoning practically all their equipment, scientific and otherwise, including most of their own clothing. Within another hour they landed near the historic Field of the Cloth of Gold, showing that Jeffries' training in Aberdeen had been indeed thorough. This was also the beginning of the air-mail service, for John Jeffries carried with him a letter to another American then in France, a descendant of the great Benjamin Franklin. Incidentally, lovers of Robert Louis Stevenson know that this famous balloon exploit is enshrined in the story *St. Ives*.

After being fêted at Calais and Paris, Jeffries returned to England and was made Warden of the Cinque Ports, an honour granted only to specially distinguished men; the present holder being our Prime Minister, Mr. Winston Churchill.

ANGLO-AMERICAN RESOURCES POOLED

Fortunately, the liaison in matters of aviation that existed between our two countries some 160 years ago, inaugurated by Dr. John Jeffries, has been extended during recent years in proportion to the remarkable progress made in aeronautics. Early in 1939 I had the privilege and pleasure of visiting the United States of America to see the high lights of aviation and its associated researches. I visited 12 States and was particularly impressed by the fine work done at Wright Field, in Dayton, by Colonel (then Captain) Harry G. Armstrong. I returned to the United Kingdom determined to build up as far as was in my power an aviation medical research organisation much on the lines of Wright Field, where the aeronautical engineer and other scientists worked as a team with those engaged in the physiology of flight. The urgent problem was to fit the machine to the man, instead of the other way round, as had so long been the case owing to insufficient coöperation between the engineering and medical groups. That was a defect which this Institute has done much to eradicate.

Since 1939 there has been the closest and happiest liaison between British and American research centres and workers, both Service and civilian, including your National Research Council. To our mutual benefit, members of research groups from both countries have visited each other, and continue to do so, to study and discuss various problems first hand. Thus on either side of the Atlantic and in the field, America, Britain, and Canada have pooled their knowledge and resources in aviation medicine to improve the comfort and efficiency of those engaged in flying during training and on operations. Among the problems investigated, roughly in order of their occurrence, have been the following:

How to provide an adequate supply of oxygen, with the maximum of comfort, at all oxygen-requiring heights under the most adverse conditions.

How to protect aircrew against cold and the occurrence of frostbite, which has now been reduced to negligible proportions (1 case in 2000 bomber sorties; that is, 1 case in 12,000 individuals engaged in these sorties) by the provision of suitable clothing, particularly electrically heated garments.

How to prevent blacking-out in combat during high acceleration without interfering with pilot-readiness, active movements, and performance under all climatic conditions.

How to guard the eyes against the glare of the sun and searchlights, without reducing the field of vision or visual acuity, and how to obtain and maintain the optimum night vision under various flying conditions.

How to deal with such stratosphere problems as the prevention of bends, the physiological requirements in pressure cabin design and development, including explosive decompression and baling out from aircraft at altitudes over 30,000 feet.

How to lessen fatigue, which is such a potent factor in the causation of air accidents.

How to improve intercommunication, as poor intercommunication leads to fatigue and many errors—especially during the height of air operations.

How to protect those in cockpits and cabins of aircraft against the possible entry of noxious substances, such as exhaust gases or hydraulic fluids.

How to prevent air-sickness, particularly among paratroops.

In addition a considerable amount of research and development has taken place in connexion with air-sea rescue, and last but not least, the evacuation of casualties by air.

The United States Army Air Force has done a stupendous job in this global war in evacuating casualties by air from all fronts to overseas bases and to the United States. Major General David N. Grant, your Air Surgeon, deserves the greatest credit for this wonderful achievement, as he does also for the gigantic strides that your country has made in aviation medicine during this war.

The British endeavour, as regards evacuation of casualties by air, has been less only in proportion to the forces employed. In 1944 the Royal Air Force alone evacuated approximately 300,000 cases of sick and wounded, mostly Army personnel, on all fronts—the Far East, the Mediterranean and in Europe proper—without a single mishap, although this evacuation involved some 20,000 separate flights and much of the flying was done from forward landing-strips near the enemy, over jungle, mountains, and sea in all sorts of weather.

HAZARDOUS INVESTIGATIONS

I should now like to pay tribute to certain medical men of both countries who have done outstanding work for aviation. Some of our theoretical calculations of the effects of stratosphere flying on man have proved to be wrong; certain hazards were overstressed, others were underestimated with resulting casualties. In 1941, during the experimental phase of adapting the Boeing 17 for operational work at higher altitudes, two Royal Air Force medical officers—Squadron-Leaders W. K. Stewart and D. A. H. Robson—had the misfortune to be in one of these aircraft when it broke up at an altitude of some 32,000 feet. Stewart was the sole survivor.

Colonel Randy Lovelace, of the US Army Air Force, in 1943 purposely and courageously baled out at 40,000 feet to make physiological observations in a parachute descent from such an altitude. He became unconscious

* Part of the speech made in acknowledging the John Jeffries award of the Institute of Aeronautical Sciences of the USA on Jan. 31. The four previous holders of the award have all been Americans—H. G. Armstrong, L. H. Bauer, E. C. Schneider, and E. Reinartz.

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almost immediately after baling out and suffered severe frostbite of the hand; but fortunately landed safely. Only last year another distinguished American research-worker, Colonel Boynton, met his death doing an experimental delayed parachute drop from 44,000 feet, though he knew the hazards. He was a very brave man and a great loss to science.

Again, Squadron-Leaders J. C. Gilson, Pask, and Stewart carried out a series of dangerous experiments—to find out how long man could live during a parachute descent without additional oxygen—in rarefied atmospheres similar to those between altitudes of 44,000 and 25,000 feet. These laboratory experiments were carried to just short of extremis and gave valuable information to help perfect apparatus and technique for baling out in the stratosphere.

In studying the problems of high acceleration in aircraft, that brilliant young American scientist, Commander Eric Lillienkrantz, met his death tragically some two years ago.

In the Royal Air Force, Squadron-Leaders W. K. Stewart and S. Davidson have carried out since 1940 many hundreds of blacking-out experiments in the air, having to bale out from damaged aircraft on more than one occasion. Squadron-Leader Davidson has also for the past year been engaged in experimental flying on jet-propelled aircraft to study various physiological problems. In this connexion, it is of interest to note that some 120 RAF medical officers are qualified pilots, many being highly skilled—flying Spitfires and even jet-propelled aircraft.

Many medical officers have made physiological and psychological observations during actual air operations against the enemy to assess the strain, fatigue, behaviour of aircrew, and general efficiency of the flyer and his equipment. Thus, on a warm summer's day in 1942, that gay lovable Highlander, Group-Captain Hugh Corner, AFC, was shot down in his Spitfire by a Messerschmitt over the English Channel when studying what he called "mental lapses" of members of Paddy Finucane's fighter squadron. Wing-Commander Roland Winfield, DFC, AFC, has done some 50 operational sorties to study aviation medicine problems in Bomber and Coastal aircraft on all fronts. Wing-Commander J. C. Macgown, DFC, earned the coveted Pathfinder badge, studying night vision problems over Berlin and other enemy targets.

To assess the flotation value of life-jackets for the unconscious man, Squadron-Leader E. A. Pask had himself anæsthetised for a total period of 3¾ hours, while he was thrown into a swimming-bath in different positions, wearing various types of life-jackets. Many of these jackets were so designed as to ensure drowning of an unconscious man. Of the type he tested, the British Mae West, the New Zealand Navy, and the German life-jackets proved to be the most efficient and to give adequate flotation. A film of these tests was shown to all concerned and most of the defects have now been remedied.

WORKING TOGETHER

In conclusion, I should like to stress that these advances in aviation medicine have only been accomplished by the full coöperation of aircraft instructors, aeronautical engineers, medical men, physicists, physiologists, psychologists, and textile experts of the United States of America, Britain, and the Dominions working in the closest liaison.

Long may this association for our mutual benefit endure in peace as in war. To quote Mr. John Winant, the United States Ambassador to Great Britain, whose words are particularly applicable to aviation: "While we have accepted the machine, we have not always learned to collaborate with one another to make the machine the servant, and not the master of mankind.... Never has it been so necessary for man to live and work and coöperate with his fellow-men as it is today."

CLOTHING COLLECTION IN USA.—UNRRA and the voluntary relief agencies in the United States are planning a United Nations Clothing Collection for war-devastated areas. Mr. Henry J. Kaiser will be chairman of the appeal, and the American public will be asked to contribute 150 million pounds weight of clothing.

TREATMENT OF COMPOUND FRACTURES BY EARLY WOUND SUTURE AND PENICILLIN

F. H. BENTLEY *
MB, BSC MANC., FRCS
LIEUT.-COLONEL RAMC

SCOTT THOMSON
MD EDIN., DPH
MAJOR RAMC

PENICILLIN CONTROL TEAM, CMF

A. K. BINGHAM
MB LPOOL

J. A. KEY
MB EDIN.

M. H. WOSTENHOLM
MRCS

CAPTAINS RAMC; AT A BRITISH GENERAL HOSPITAL, CMF

AT the beginning of 1944 penicillin was first available to military hospitals in Italy. Encouraged by the experiences of surgeons in North Africa, and under the teaching of Lieut.-Colonel J. S. Jeffrey, at that time Penicillin Officer in Italy, a start was made in this hospital using penicillin in the early repair of flesh-wounds.

Patients were taken to the operating-theatre the day after their arrival at base hospital from the casualty clearing stations, usually about the fourth day. The wounds were cleaned, further excised if necessary before suture, and penicillin was instilled through rubber tubes into the sutured wound twice daily for five days. The results of the first 200 wound sutures done at this hospital have already been reported.[1] They showed primary union in 190 of the 200 consecutive cases. Simultaneously the practice was developing at other centres, until, under the instruction of the Consulting Surgeon, AFHQ, delayed primary suture became the standard treatment of all suturable flesh wounds at base hospital in this theatre of war.

The arguments that commend early repair of a flesh-wound apply with even greater force to the early conversion of an open into a closed fracture. After the first month's experience of the excellent results of early suture, it seemed justifiable to try the same method for wounds complicated by an injury to bone. Accordingly, in February, 1944, we began to treat open fractures by early wound suture and local instillation of penicillin through tubes, in addition to the routine methods of external fixation of the fracture.

The results were as satisfactory as in uncomplicated flesh-wounds, and this report describes the first 62 cases treated. All received penicillin locally into the wound. Later in the series, as more penicillin was available, some cases received a parenteral course as well, though without obvious difference in the result. Of the 62 fractures treated, 58 obtained primary healing of the soft tissues, and 2 healed after removal of a foreign body; these 60 all proceeded to normal bone union. Two were failures.

Methods

Of the 62 cases, 57 were battle injuries due to missiles and had received the routine primary wound-treatment at casualty clearing stations—namely, debridement, decompression, application of bacteriostatic and occlusive dressing. The majority were immobilised with plaster-of-paris. The remaining 5 cases were road accidents, of which 3 had been treated forward in similar fashion to the battle injuries. The other 2 were admitted directly to hospital where it was possible to combine wound excision with immediate repair.

Casualties usually arrived at hospital about the 3rd or 4th day after wounding. Sulphonamides had been given by mouth as a routine, the average dose being 20 grammes. No further sulpha-drugs were given after penicillin treatment was begun. If on arrival the patient was not toxic and the limb was comfortable the wound was not disturbed, and the patient was given 24 hours' rest. During this day the limb was X rayed to define the fracture and the precise position of any foreign body. Next day the wound was examined in the operating-theatre, and sutured if practicable.

The time of wound suture varied from the 3rd to the 20th day, the average being the 6th day. The skin of the limb was cleaned and the wound was then explored with the finger. Any deep track was fully opened up to reveal the extent of the problem and in order that

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* Formerly officer i/c Surgical Division of a British General Hospital, CMF.

1. Bentley, F. H. Report to War Office, May, 1944; *Brit. J. Surg.* 1944, 32, 132.

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penicillin solution might subsequently reach all parts of the wound.

The possibility of skin suture was demonstrated by pressing together the wound margins. The skin edges were then narrowly excised, together with the superficial wound, unless they were perfectly clean, and the wound margins were undermined for the minimum distance necessary to ensure approximation. Devitalised and loose tags of muscle were removed, and deep tracks were mopped dry. Loose bone in surrounding muscle was picked out, but fragments in the line of the fractured bone were not disturbed. Comminution of the bone was such that the "fracture-line" was usually an inch or two in length. Early in the series we learned the importance of removing a metallic foreign body lying in relation to the fracture, and thereafter such bodies were always carefully localised before operation and removed. (This subject is referred to more fully below.)

The wound was now ready for suture. Suitable lengths of fine rubber tubing (4 mm. diameter) for subsequent instillation of penicillin solution ("penicillin tubes") were introduced through stab incisions made at least 1 inch from the wound margins. Usually two tubes were introduced, one to either side of the fracture. They led down to the region of the hæmatoma surrounding the fracture without touching the bone. There is always a potential cavity around a comminuted fracture, and one tube at least was placed so that it would act equally well as a drain through which the cavity could be aspirated before each instillation of penicillin in the ward. This detail is important.

The skin was then closed with interrupted silkworm gut stitches. No deep sutures were used. A considerable degree of tension could be safely allowed, since under treatment with penicillin œdema was quick to subside, but extreme tension was dangerous—as always—and tight skin-flaps stretched over a hollow in the tissues ("tentage") were certain to break down at this point (vide infra). Where there was difficulty in closing a wound the answer was either to rotate a flap of skin and fat to complete the suture—a very useful manœuvre—or if the gap was floored by muscle to apply an immediate graft to the open area. This method of obtaining a complete closure was often employed and always successful. We wish to emphasise the importance of obtaining a complete skin closure at the repair operation if subsequent infection is to be avoided.

In cases of fracture of the extremities a dry dressing was secured to the limb and plaster fixation applied in routine manner, the rubber tubes protruding for 3 inches through the plaster. The tubes did not interfere with manipulation of the fracture as the plaster was being applied. When the cast was set, the tubes were secured to it with a stitch and penicillin solution instilled down each. They were then kinked over a sterile swab laid on the cast, covered by another swab, and the whole fastened down with a light cotton bandage.

Aspiration followed by instillation of solution of sodium penicillin was performed through the tubes morning and evening for the next 5 days. On the 6th day the tubes were freed from the cast and withdrawn, the small holes in the plaster being sealed with a plaster bandage. Usually the cast was not changed for 3 weeks, when the skin sutures were removed and a second plaster was applied.

The technique for fractures of the flat bones, ilium, and scapula was the same, except that no plaster cast was necessary and skin sutures were therefore removed on the 14th day.

Further treatment of the fracture followed routine lines. Exercises were encouraged and the patient was placed under the care of the physiotherapy department from an early stage.

DOSAGE OF PENICILLIN

Five c.cm. of sodium penicillin solution (500 units per c.cm.) was introduced through each tube at the end of the operation, and 3 c.cm. per tube twice daily for a further 5 days. Since most cases had two tubes, this amounted to 6 c.cm. of solution twice daily into the fracture region with a total dose of 35,000 units of penicillin. This proved sufficient to ensure sterilisation of the injured bone and soft parts with consequent primary healing. When parenteral penicillin was given in addition it was continued for 4 days (480,000 units).

TYPES OF WOUND

The 62 fracture cases treated in this way included both penetrating and through-and-through wounds. They varied in length up to 12 inches, but the average was 4 inches, leading through the covering soft tissues into comminuted bone. Comminution was often severe, as is customary with gunshot wounds, but the line of the bone, even if only occupied by bone chips, was surprisingly well preserved.

The bones involved were —

Tibia alone	10	Ilium	8
Fibula alone	7	Scapula	4
Tibia and fibula	5	Tarsus	4
Humerus	9	Patella and femoral condyle	2
Radius and/or ulna	13	Total	62

Major fractures of the femur were not studied, since fractures of this bone were segregated in three orthopædic centres in Italy where they were the subject of a special investigation.

Most of the wounds were clinically clean, but 8 were clinically septic, and of these a wound swab revealed coagulase-positive *Staph. aureus* in 7.

SELECTION OF CASES

The only criterion used in selecting cases for the above method of treatment was that there should be sufficient skin for complete closure, or, if sufficient skin was not available, that the surface of the resulting defect was suitable for skin-grafting. No other factor (such as the age or condition of the wound on arrival, the extent of comminution of bone or muscle laceration) was considered a contra-indication. As a result, the series so treated represented about 70% of all compound fractures admitted to hospital.

Results

Primary healing of the sutured wound and quiescent union of the fracture with no sign of inflammation occurred in 58 cases. No case was observed for less than 5 weeks, when some of the less serious fractures of the ilium, scapula, ulna, and fibula were fit for discharge to unit or convalescent depot. Other fractures were under treatment for a longer period, and all were retained until union was sound.

A feature of these results was the early recovery of function of the injured part as a result of the primary healing and absence of scar tissue, even though there had been much muscle loss. As an example, a wound of the back measuring 8 × 3 in., with extensive muscle laceration leading into a comminuted fracture of the body and spine of the scapula, was healed in 14 days, and the patient was discharged to convalescent depot in 35 days, having full movements of the shoulder and arm.

Fractures of the shafts of long bones had no points of unusual interest once healing of the flesh wound was secured, but two types of injury are worth special mention.

The first is the through-and-through wound of the foot with fracture of the tarsus and metatarsus. In the North African campaign we had considered that the worst results in the surgical division were obtained in the comminuted tarsal fractures, either from pocketing of deep infection or from painful union. We were eager therefore to attempt this present method of treatment, and were satisfied with the results. Primary union occurred in the 3 through-and-through wounds treated, and fusion of the fractured tarsal bones followed to give a painless foot under conditions of moderate strain. It was thought that the medical category of these men would be B 7. The fourth tarsal fracture was an interesting one demonstrating the possibilities of the method employed.

A mortar bomb explosion had split the soft tissues of the heel from malleolus to malleolus exactly like the incision for a Syme's amputation. The injury also split the os calcis in the same line, and the bone had opened out in an inverted V-shaped manner, the apex of the V being at the subastragaloid joint. There was little tissue loss, and it was possible to press the two halves of the bone together and suture the skin of the heel. A fine penicillin tube was in this case led

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into the fracture. Primary union followed, and, after a long period in a series of walking plasters, the man left for the United Kingdom free from plaster or dressing as a walking case. The heel was free from tenderness and should be fit for moderate strain.

We consider that this case would have needed amputation but for the possibility of primary repair that the method offered.

The second important type of injury is the fracture that is compound into a joint, most commonly seen at the elbow and knee. Two case-histories illustrate the results in this type of injury.

Private A.—Bullet wound, fracture of the internal condyle of the humerus and coronoid process of the ulna, with a 6 inch flesh wound (anterior to the ulnar nerve) leading at one point to a ½ inch hole in the capsule of the elbow-joint. After removal of loose pieces of bone, the wound was closed by rotating a flap of skin and fat, and a fine penicillin tube passed down to a point ½ inch away from the rent in the joint capsule, which could not be sutured. Primary union followed and active movement was then encouraged. After 8 weeks there was 80% full range of movement at the elbow-joint, and the man was discharged to a convalescent depot.

Major B.—Mortar wound of the knee. A fragment of bomb had fractured the edge of the patella and passed across the joint deeply into the internal condyle of the femur, where it lodged. The foreign body and a piece of battle-dress were removed from the bone at operation, and a capillary rubber tube was introduced into the walnut-sized cavity that opened through the anterior articular surface of the femoral condyle. It was possible to suture the skin-wound without tension. Only 6000 units of penicillin was run into the bone cavity because it was feared at that time that an excess of fluid might soil the joint. The joint, however, remained quiescent and the wound healed by first intention. After 9 weeks the patient was walking, and the knee-joint was capable of full extension and 30° flexion. He was evacuated to the United Kingdom for prolonged rehabilitation.

Two cases of fracture of the ilium, whose wounds appeared to have united by first intention, broke down after 2–3 weeks. In each the reason for breakdown was a retained metallic foreign body causing a local abscess. In one case penicillin had been given parenterally as well as locally. Removal of the foreign body and re-suture of the wound combined with the use of penicillin locally were followed by quiescent union of flesh wound and bone. The subject of foreign bodies is referred to below.

L/cpl. C.—Grenade wound of the buttock, with a 5 inch wound through the full thickness of the glutei into a long, comminuted fracture of the ilium. X ray taken at casualty clearing station showed the fracture, but no foreign body was visible. Accordingly routine penicillin suture was performed, followed by a course of parenteral penicillin. Two weeks later the suture line gaped. A wound swab showed *Ps. pyocyanea* only. We were therefore at a loss to understand the breakdown, and the wound was re-explored. A cavity was found in the lateral part of the buttock connecting with the main wound and containing a small quantity of pus (*Ps. pyocyanea* only) and a lump of metal 1 in. × ¾ in., which lay outside the field of the previous X ray. The metal was removed and the wound resutured, again using penicillin tubes. Primary healing followed this second operation and the patient was discharged to convalescent depot at the tenth week.

Private D.—High explosive wound of the hip, with a 6 inch flesh defect above the great trochanter leading into a comminuted fracture of the ilium. There was a hole 1 inch in diameter in the fractured bone. X ray showed that the foreign body had passed across the pelvis and lay adjacent to the tip of the transverse process of the 4th lumbar vertebra. The foreign body was considered to be too far from the fracture to require removal, and the wound was sutured in routine manner, one of the penicillin tubes passing down to the hole in the ilium. Three weeks later the central inch of the suture line broke down and a sinus formed. Swab showed *Staph. aureus* (penicillin-sensitive). Because of the difficulty of an exact localisation of the foreign body and the problem of surgical approach, its removal was deferred, and it was hoped that the sinus would close spontaneously. This did not occur, and after 102 days an extraperitoneal approach was made from the right iliac fossa and a ½ inch piece of metal found and removed from the psoas muscle at the side of the body of L IV. No track was discovered between this site and the ilium, but suture of the orifice of the sinus and introduction of a penicillin tube through a stab incision down to the region of the hole in the ilium was followed by union. The man was discharged to convalescent depot 31 days later, having no obvious disability.

Two cases were failures—one a fracture of humerus with large tissue loss posteriorly, the other a fracture of the lower end of the tibia with a cavity in the bone produced by a large piece of metal. The latter case had parenteral as well as local therapy. In each instance the skin was sutured under tension over a hollow in the bone. It was impossible to rotate a flap and free grafting was impracticable. Breakdown occurred in both during the first week, swabs from the wounds showing *Ps. pyocyanea* only. These examples reinforce a lesson we have learned from flesh wound suture, that "tentage" spells failure.

In about half the total cases parenteral penicillin (4 days, 480,000 units) was given in addition to the routine local therapy. No difference was observed between the results of those having local instillation and those having a parenteral course as well. Both were equally satisfactory.

The disposal of the cases is shown in the table. Of the 62 cases of compound fracture treated by this method, 48 returned to duty. It is not unfair to assume that few of these would have remained on active service abroad if they had been treated by other methods. Twelve men went home, 8 for lengthy rehabilitation, and 4 because of multiple injuries. There were 2 failures resulting from undue tension in the suture-line, as described above.

DISPOSAL OF CASES

Site of fracture	Returned to duty	To UK for long rehabilitation	To UK for other injuries	Failures	Total
Tibia alone	8	1	0	1	10
Fibula alone	6	0	1	0	7
Tibia and fibula	2	3	0	0	5
Humerus	7	1	0	1	9
Radius and/or ulna	11	0	2	0	13
Ilium	7	0	1	0	8
Scapula	4	0	0	0	4
Tarsus	3	1	0	0	4
Patella and femoral condyle	0	2	0	0	2
Total	48	8	4	2	62

Discussion

The methods have been described in some detail because the results show that the presence of a bony injury need not complicate the practice of repair, and that uniformly good results may be looked for if the wound over the fracture can be closed. From our investigations we are convinced of the importance of removing a foreign body in relation to the fracture, of the necessity for complete skin closure, and of the value of local application of penicillin to the fracture region.

PRESENCE OF A FOREIGN BODY

In the suture of uncomplicated flesh wounds the presence of a buried metallic foreign body had not been found to be a source of trouble, so, unless it was large, a search was not made for any missile not readily found by the exploring finger. Early in this series of compound fractures, however, the importance of removing a foreign body was brought unpleasantly to our notice in the 2 cases of fracture of the ilium referred to above (L/cpl. C and Private D).

After this early experience we invariably localised foreign bodies precisely by X ray and removed them.

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either at the first operation or by a separate approach after a week or so if removal through the wound of injury was impossible. Two cases in which the latter method was necessary were instructive in demonstrating the danger of a metallic foreign body in bone and the necessity for its removal. One was a fracture of the humerus and the other a fracture of the tibia, but the findings in both were the same. The piece of metal, after penetrating the cortex, had passed for 2 inches along the medullary cavity. One to two weeks after the suture operation the foreign body was exposed through a separate incision by sinking a burr-hole in the cortex of the bone over the piece of metal. It was found to be lying in a cavity in the medulla, and except at a few points was out of contact with the surrounding tissue through which it might otherwise have been sterilised by parenteral penicillin. Thus, in addition to the liability of remote physicochemical reaction, it constituted an immediate and uncontrollable source of infection. An illustrative case, not in the series, is quoted—

Private E.—Grenade wound of the ankle with foreign body lying in the centre of the astragalus. Skin suture was impossible. An occlusive dressing was applied and a five-day course of parenteral penicillin given. Two days later the wound was exposed and the foreign body removed. A swab was inserted into the cavity in which the metal had lain, and was reported "*Staph. aureus*+++, penicillin-sensitive."

In each of the two cases of fracture of humerus and tibia described above, a penicillin tube was inserted into the cavity in the medulla after removal of the foreign body and the skin incision was sutured. Normal healing followed and both men were later discharged to convalescent depot.

COMPLETE SKIN CLOSURE

The necessity for complete skin closure is twofold. It prevents further infection reaching the bone and reduces scar-tissue formation to a minimum throughout the whole wound, since deep tissues heal more rapidly and smoothly under intact skin. It is evident that what our American colleagues refer to as "the value of the intact epithelial envelope" is of prime importance in wound healing, and involves more than the prevention of infection.

Prevention of infection is nevertheless essential in the successful treatment of an open fracture, and it is our opinion that partial suture of a wound does not ensure that the fracture will become sealed off and safe from reinfection. The advisability of a period of drainage of a fracture by leaving the wound partly open is being debated at present. It appears to us that, if the hæmatoma region of the fracture is sterilised by instillation of penicillin locally, and pooling of blood or serum is prevented in this region during the first few days after repair by means of a penicillin tube, the problem of "drainage" is solved. The track of a penicillin tube—introduced through a stab incision—is closed in 48 hours after removal of the tube, and if the wound of injury is sutured there is no possibility of reinfection; our results support this latter contention.

Furthermore, information is available to show that reinfection of an incompletely sutured fracture wound does occur.[2] Fraser and his colleagues investigated the use of penicillin in the closure of open fractures admitted to a hospital in Sicily from the Salerno beaches. In 21 cases the wound over the fracture was only partly sutured, the wound was dusted with penicillin powder and dressed with soft paraffin gauze under a closed plaster cast. About half of the cases received a short (3–4 day) parenteral course of penicillin. A swab was taken from the wound at the suture operation, and again 2–3 weeks later when the plaster was changed. Eighteen of the 21 cases showed no pyogenic cocci at the suture operation, but only 7 of these were still uninfected at the change of plaster, 11 yielding growths of pathogenic bacteria. Thus out of 18 uninfected incompletely sutured compound fractures 11 subsequently developed pyogenic organisms in the wound.

Furlong and Clark,[2] in a series of compound fractures of the femur treated by partial suture and parenteral administration of penicillin (910,000 units over 8 days), reported that, out of 13 cases where wound swab at the time of suture revealed only coliform bacilli, 9 showed pyogenic cocci at the first change of dressing 3–4 weeks afterwards.

The precise significance of pathogenic cocci in the granulating wound over a fracture has not been fully assessed. If the fracture is truly sealed off they may not be of great significance, but it is a common experience that in some cases in which a granulating wound over a fracture has been slow to heal a sinus into infected bone has later declared itself. There is no certainty of the final result in the description that is sometimes given of "wound granulating but fracture sealed off."

LOCAL OR PARENTERAL PENICILLIN?

Inspection of a gunshot wound causing a compound fracture usually reveals an extensive area of comminuted bone and considerable laceration and bruising of the surrounding muscles, which are lifted off the bone for a short distance so that a potential space exists around the fracture site. The whole area of damaged bone and muscle is filled with extravasated blood, and is referred to by us as the "hæmatoma region." Only the clot lying in the wound cavity, and the larger loose pieces of bone in surrounding muscle can be removed at operation. There remain numerous more or less avascular bone particles in the fracture, and much extravasated blood among the bone fragments and in the damaged muscle. If bacteria are carried into this region by the missile they can multiply out of range for the moment of the full effect of a blood-borne bacteriostatic that must reach them by transudation across the damaged area. They may therefore still be active when administration of the bacteriostatic is discontinued.

These observations imply that parenteral penicillin may not be effective in sterilising infection lying in the hæmatoma region during the first week or so after injury, and this is borne out in practice. For example we may quote 2 cases of through-and-through gunshot wounds of the thigh with compound fracture of the femur and small clean flesh wounds. In one, the wounds were completely sewn up on the 5th day, and 600,000 units of penicillin given parenterally over 5 days. In the other, repair was done on the 10th day, and penicillin given for a week with a total of 840,000 units. In both the wounds united, but from the 15th to 21st day deep inflammation was evident, and pus discharged through the suture-line. Culture gave a growth of *Staph. aureus*, penicillin-sensitive. A sinus into infected bone developed later. In another case, a shell wound of leg with fractured tibia, the wound was completely sutured on the 5th day, and 480,000 units of penicillin given parenterally over 4 days. A week later the wound became inflamed and pus containing *Staph. aureus* was discharged. The organism was found to be penicillin-sensitive.

Similar observations have been reported by Furlong and Clark in their War Office report of May, 1944. Bacteriological data are provided by Fraser and others who were able to examine fracture wounds in the middle of a parenteral course of penicillin. They describe 3 cases where, at the end of 3 days' administration (360,000 units), swab of the fracture region revealed *Staph. aureus*, penicillin-sensitive.

There seem to be two ways of trying to solve this problem. One is to continue the parenteral administration of penicillin throughout the whole period in which the hæmatoma region is being revascularised, bone fragments absorbed, and the new osseous framework laid down. The other is to apply penicillin locally in such strength and volume that it spreads and diffuses through the hæmatoma region and maintains a bacteriostatic concentration in and around the damaged tissues, until by the end of 5 days pathogens are destroyed.

We have no experience of the former method. If it is attempted, it might be necessary to prevent collection of pus in the potential space around the fractured bone; for it is recognised that a pool or "sump" of pus may form in this situation, particularly in the case of a gross fracture surrounded by bulky muscle. Our experience with flesh wounds shows that a pool of pus, even if sterile or infected by non-pathogenic organisms, invariably bursts through the suture line. It is one of the

2. Fraser, I., Patrick, W., Thomson, S. Report to War Office, November, 1943. Furlong, R., Clark, J. M. P. Report to War Office, May, 1944; *Brit. J. Surg.* 1944, **32**, 147.

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advantages of the local instillation method that although it adds fluid to the hæmatoma region, injection can be preceded by aspiration, and if the tubes are correctly sited no pool will occur.

The instillation of solutions of penicillin to effect sterilisation and primary union of a compound fracture wound was the logical outcome of the success of this method in suture of flesh wounds. We have found it entirely satisfactory when combined with the surgical technique described in this report. There may be occasions when it is doubtful whether the penicillin solution can reach all parts of the wound, and when the addition of parenteral treatment will constitute an additional safeguard. But among many cases of penetrating lacerated muscle wounds of the thigh we have had no instance in which local penicillin therapy failed to sterilise any pyogenic infection present; and in this series of compound fractures local penicillin therapy alone was found to be in no way inferior to local plus parenteral treatment.

Pus due to coliform bacilli ("gram-negative pus"), which is a feature of local penicillin-solution technique, was not found a source of trouble, providing it was not allowed to collect and constitute a mechanical problem. Neither in these fractures nor in 500 flesh wounds sutured similarly have we seen an instance of sepsis of bone or soft tissue due to *Ps. pyocyanea.*

There is a further problem to discuss—the use of local and parenteral penicillin in combating infection due to a *Staph. aureus* that is insensitive to penicillin by the ordinary tests. A survey of battle wounds showed the organism of initial sepsis to be almost always the *Staph. aureus*, and in an investigation of many hundreds of wounds at forward base hospitals we have found that 20–50% (depending on therapy at casualty clearing station) harboured this organism on admission to hospital; 17% of the staphylococci were resistant to concentrations of penicillin obtained in the blood or tissue fluid by parenteral therapy alone. This constitutes an appreciable hazard in the closure of an open fracture.

The percentage of staphylococci resistant to penicillin is less, however, when the concentration of penicillin is increased above that obtained in the blood. In a study of strains of *Staph. aureus* designated "resistant," all grew freely in broth containing 1/10 unit of penicillin per c.cm., corresponding to the usual blood concentration. Approximately half grew when the penicillin was increased to 10 units per c.cm., and only a few grew in a concentration of 50 units per c.cm.

It is reasonable to think that the instillation at 12-hourly intervals of solutions of penicillin containing 500 units per c.cm. will maintain a higher local concentration of penicillin than that produced by parenteral therapy, and therefore will be more effective in dealing with staphylococci that possess some degree of resistance.

Summary

Wound suture at an early stage combined with penicillin therapy was performed in 62 cases of war wounds associated with fractures. There were 58 immediate successes, with primary union of flesh wound and bone, and 2 in which success followed operation for removal of a foreign body. Two were failures.

All cases received penicillin locally, but only half received a course of parenteral therapy in addition. The same degree of success was obtained in both.

The importance of removing a foreign body and the necessity for complete skin closure are stressed.

Parenteral penicillin cannot sterilise avascular bone fragments and extravasated blood around the fracture during the first few days, whereas the local instillation of penicillin in sufficient strength and volume can do so. When combined with the surgical technique described, local penicillin instillation has proved entirely successful in sterilising and effecting primary union of compound fracture wounds.

We wish to thank Colonel C. H. K. Smith, Officer Commanding the British General Hospital, for the help that made this investigation possible, and for permission to quote from the hospital records; Major F. Pygott for his careful radiological localisation of foreign bodies; and Miss T. F. Rickards, Physiotherapy Service, under whose direction rehabilitation of the injured men was conducted.

COMPOUND FRACTURES OF THE FEMUR

TREATED WITH THE AID OF PENICILLIN

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THE use of penicillin has encouraged the employment of methods in the treatment of fractures of the femur which, although considered desirable, have not been generally regarded as safe.

When a debridement has been done some days previously, the use of penicillin makes it possible to sew up infected and purulent wounds and to encourage active movement, not only without danger to the patient but with positive benefit to the limb. On early closure and early movement depends the fullest possible restoration of function, for early closure limits the extent of the scar and diminishes the chance of bone sepsis; and early movement of the knee is even more desirable in preventing adhesions in compound fractures than it is in closed fractures.

These methods were occasionally used before penicillin but now they can be used with greater success and safety. Formerly it was the danger of spreading sepsis that was feared, but now, with penicillin, we have the assurance that as soon as streptococci, staphylococci, and anaerobic bacilli enter the blood- or lymph-stream they are destroyed.

A possible reason for the lack of enthusiasm shown by some surgeons for the use of penicillin in fractures of the femur may be that with the exception of the injections they have treated their cases in the conventional manner. The skin has not been sutured as early as possible, nor have early movements been encouraged. Certainly penicillin does not have so dramatic an effect on local sepsis as it does on the prevention of its spread, but that prevention is absolute. For instance, there were no deaths, no amputations, and no septicæmia in our series; and it is noteworthy that Furlong and Clark (1944), who seem, on the whole, not to have been very favourably impressed by the effect of penicillin on these cases, also had no deaths from sepsis and no amputations for sepsis in their series of 70 compound fractures treated with penicillin; whereas in the 70 controls there were 3 deaths and 4 amputations due to sepsis.

The *Medical History of the War* (1922) quotes a memorandum by Sir Anthony Bowlby in which he estimated that at the end of the last war the overall mortality for fractures of the femur, excluding cases with associated injuries, was about 15%. Most of the deaths were due either to pyogenic infection or gas-gangrene. The *History* also shows that the value of early suture and early movement became appreciated towards the end of the war. Thus in No. 8 General Hospital in France, of 211 femur wounds treated by delayed primary suture, 161 were successful. Bowlby observed: "the results of treatment of open fractures of the femur have very greatly improved in proportion as the practice of delayed primary suture has increased. Closure diminishes risk of all kinds of complications and gives rise to much more rapid union." Further, Pearson and Drummond (1919) were impressed with the importance of obtaining knee movements from the start and for this purpose used Besley's callipers. In those days, even with the grave danger from spreading sepsis, it was thought desirable to close wounds early and start early movement. How much more desirable is it to follow these principles now, when the danger to life and limb is removed and we are free to concern ourselves with attempting to restore a complete and early return of function.

EXPERIENCE SINCE D-DAY

We have treated 70 cases of fractures of the femur since D-day, June 6, 1944. The great majority of patients reached us between the third and tenth days after wounding. All came in Tobruk plasters, having had debridement of the wound, the wound being left open. Many had associated injuries, but all had travelled well and were not obviously imperilled by the journey. The primary treatment they had received was of a very high standard.

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Nearly all the patients had had some penicillin before arrival, but the doses in transit varied within wide limits, both as to dosage and number of injections. As a rule, they had had four or five days' continuous treatment with two to five injections a day, the dose being usually 20,000 units and sometimes 50,000 units. There may have been a gap of some days when penicillin was not given, but on arrival here they were immediately started on a five-day course of 20,000 units intramuscularly every three hours.

Many patients arrived with a temperature of about 100° F and pulse-rate of 100–110 per min. The temperature in most of them subsided a week after suture. Sometimes the penicillin was omitted before the temperature had settled. The temperature was not thought to be a reliable guide, for penicillin is sometimes in itself the cause of pyrexia. Better evidence of the patient's progress could be obtained from inspection of their local and general condition, and, if they have been ill for a week or so, by an estimation of the hæmoglobin.

After 24 hours' rest, the plasters were removed under anæsthesia and the wounds were inspected. Nearly all had a sulphonamide 'Vaseline' gauze pack. Pus in varying degrees was present in most of the wounds. In some the pack had, by swelling of the soft tissues from œdema, become a plug or bung and was damming up the pus. A few had sloughs, but when these were removed, and when the pus was cleared up, the wound looked clean.

After the first few cases, we became convinced that complete closure of the skin gave by far the best chance of early healing and avoidance of bone infection, and wherever possible the wound was thereafter sewn up completely, regardless of the amount of infection present. Even if the wound could not be completely closed at the first inspection, owing to œdema, as much as possible was sutured, and it was nearly always found that an incised wound without gross skin loss could be completely closed five days later.

The suturing was not determined by bacteriological findings but on anatomical grounds alone. It was felt that only streptococci and staphylococci would be likely to enter the blood and they would there be destroyed through the action of the penicillin. We have found that the penicillin-insensitive microbes have no tendency to give rise to septicæmia or spreading sepsis. It is probable that their effect remains local and that they largely act as saprophytes. If the wound is sutured they have no pabulum and consequently die off.

A swab was always taken at the time of first inspection. Only in 2 wounds out of the 70 cases were streptococci and *Staph. aureus* found on culture. Many, however, had coliform bacilli and some had *B. proteus*. A few had gas organisms and one had *Ps. pyocyanea*. The streptococci and staphylococci had been killed by the penicillin, and any pus was due to gram-negative organisms and was only mildly noxious.

DRAINAGE

Drainage is not desirable in these cases. It is probably better to include gram-negative organisms than, by leaving the wound open, to allow access to streptococci and staphylococci, which will grow after cessation of the penicillin, particularly if a thick layer of granulation tissue has formed a barrier to systemic penicillin. It is more important to prevent microbes getting in than to give a permanent exit for this kind of pus. With any sort of drainage there is the possibility of two-way traffic. Even penicillin tubes seem to do more harm than good. A sinus often followed, though as a rule this healed in a week or two. There is reason to suppose that it would not have occurred if the tube had not been inserted. In 2 instances in which a penicillin tube was inserted gram-positive cocci reappeared after the removal of the tube.

With drainage or without it there was no instance of spreading sepsis. It has not been necessary to open an abscess in any other part of the thigh than the original wound; in fact, only in 2 completely sutured cases was it necessary to reopen the wound. There has been no cellulitis, lymphangitis, or septicæmia.

Sumping, or the loculation of pus, has not occurred in any case completely sutured. In 6 unsutured wounds on the anterior aspect of the thigh, with the opening pointing upwards, there was a tendency for sumping to occur. In one case only was it accompanied by constitutional symptoms.

Suture, or even partial suture, by obliterating the dead space prevents a sump, and, even when the wound is not sutured, movements of the knee produce a pumping action of the quadriceps, thereby limiting the size of the sump by emptying it every time the muscle contracts. In no instance was a posterior counter-incision necessary; nor was it necessary to obtain dependent drainage by applying a spica and turning the patient on his face.

RESULTS OF SUTURE

Of 48 cases completely sutured, 40 healed in a month; 4 more healed at three months; 4 failed and had a sinus at three months. Of 17 which could be only partially closed, 11 were healed and 6 had a sinus at three months. Of 5 cases which had to be left completely unsutured 2 were healed and 3 had a sinus at three months. Thus only 4 of the 48 completely sutured had a sinus at three months against 9 of the 22 incompletely closed. The extent of the bone damage was comparable in each group.

The success which accompanies suture of the wound on the third day prompts one to think that it might with advantage be sewn up on the first day at the time of debridement, provided that continuous observation is possible. From our experience it seems as if, with penicillin, drainage after that period is unnecessary.

CHRONIC BONE SEPSIS

In 13 cases a sinus leading down to the bone was present at three months. Of these, 5 had a low-grade osteitis of cancellous bone at the upper or lower end. Four have had sequestra removed and there is a possibility of this being necessary in a further 3. One has a frank osteomyelitis; this man had a large buttock wound which it was impossible to suture.

UNION OF BONE

Union of these compound fractures proceeds as quickly or even more quickly than in closed fractures. The factors which lead to this surprising result are difficult to determine. The fragmentation that accompanies a gunshot wound may contribute to a more copious production of callus. It may be that the hyperæmia caused by the controlled infection plays its part. If the sepsis were not controlled by the penicillin it might become a danger to union, but a slight amount of infection may help union by inducing a useful hyperæmia. Even when chronic sepsis of the bone develops, as evidenced by a persistent sinus, union was not delayed, nor was walking deferred.

It is extremely undesirable, and also quite unnecessary, to remove bone fragments unless, as occasionally happens, they are widely displaced. Even if stripped of periosteum the fragments become revascularised and incorporated in the bone. It is remarkable how a mixture of small bone fragments and pieces of metal grows together to form a new shaft.

To secure union in a grossly comminuted fracture it is unnecessary to allow the bone to shorten by telescoping the fragments. The normal length may be safely retained. The maximum shortening in the cases treated with traction was ½ inch, with the exception of one case in which bone fragments were inadvisably removed.

Where, owing to bone loss, a mere bridge of bone remains joining the two main fragments, union proceeds at a normal rate, but there will be no tendency for this bridge to thicken, possibly because it becomes closely invested by a new periosteum. Before weight-bearing is allowed it may then be necessary to thicken the bridge by a graft.

In compound fractures, as in closed, the most potent cause of delay is overpulling. Non-apposition of the bone fragments, so long as they are not overpulled, does not appear to delay union. Lateral gaps of ½ inch are satisfactorily bridged, but with some delay in weight-bearing.

In 62 cases the average time of union, judged from the time of discarding all splintage, was thirteen weeks. Weight-bearing was allowed about two weeks later. In 5 cases a graft to reinforce a slender bridge of bone will

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be necessary. Two cases will not unite owing to loss of the head and neck. One has simple non-union requiring plating after the bone ends have been freshened.

RESTORATION OF FUNCTION

Until penicillin became available most of our compound fractures of the femur were left unsutured and treated in spicas. Most had stiffness as a result, and it was not uncommon to see an immobile lifeless limb sodden with pus. Since then they have been treated with skeletal traction with a pin through the tibia, and early movement of the knee. We took this somewhat unorthodox step with diffidence, fearing that the effects of sepsis might be increased and that union and the healing of soft parts might be delayed thereby. None of these fears however proved justified. Early movement of the knee brings about the early disappearance of œdema and greatly reduces adhesions between tissue planes and muscle and bone. The danger of intra-articular adhesions is also lessened. Not only is the extent of the scar greatly limited by early suture, but it is prevented from contracting by movement of the knee; mere static contractions of the quadriceps are less effective in this respect.

Early movements of the knee are accompanied by movement at the fracture site in the early weeks. This has been accepted. But it has proved no disadvantage, since it has caused no loss of apposition and no delay in union.

In 12 cases early movement was not possible because either extensive bone loss or a large buttock wound made a spica necessary, or, in 3 instances, owing to irreparable damage to the quadriceps tendon and the knee. All but 1 of these 12 cases had a greatly restricted range at twenty weeks.

The great majority (58), however, were treated with early knee movement. At four months, 3 of them had full range, 23 had 90° or more, 21 had 45°–90°; it is expected that all of these 47 will have a full range at nine months. Nine cases had a range of 30°–45° at four months, and a proportion of these will have a full range at nine months. In 2 only was the knee written off.

If a forecast may be permitted we expect that 40–50 of these patients will have a normally functioning limb within nine months.[1]

SUMMARY

In the treatment of 70 cases of compound fractures of the femur due to wounds sustained in operations in North-West Europe penicillin has abundantly justified itself as a defensive weapon. To exploit its value to the full it should be used as a weapon of attack; for with it two extremely desirable principles can be followed—early closure of the wound and early movement of the knee.

There were no deaths, no amputations, and no evidence of spreading sepsis. In the 48 cases that were completely closed restoration of function as well as the rate of union were equal to that in closed fractures. It is expected that from 40 to 50 will eventually have no disability from their fractured femur.

REFERENCES

Furlong, R., Clark, J. M. P. (1944) *Brit. J. Surg.* **32**, 147.
Medical History of the War (1922). Medical Services: Surgery of the War, vol. II, pp. 355, 359.
Pearson, M. A., Drummond, J. (1919) Fractured Femurs, London.

1. In oblique fractures we have had 3 instances of the spike of the upper fragment piercing the quadriceps. Before an appreciable range of movement could be obtained at the knee the spike had to be removed. This was not done until the fracture had united at its upper part.

THE REGIMENTAL MEDICAL OFFICER.—At a recent conference in Bengal attended by 158 doctors from the British and American armies, the Royal Navy, and the RAF, emphasis was laid on the responsibility borne by the regimental medical officer. Like the general practitioner at home, he was the backbone of the medical services, and only too often he had little reward. His work was at times monotonous, at times arduous, and often taken for granted; he lacked the stimulus of close contact with his colleagues and with hospital researches, and his patients were lost to him as soon as they were evacuated. The conference accepted the principle of "Best Men Forward." The RMO, working alone and under conditions of discomfort and often danger, should be regarded as the embodiment of the RAMC motto *In arduis fidelis*.

ARTIFICIAL RESPIRATION BY RIB TRACTION

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LIEUT.-COLONEL IAMC

THE main time-honoured methods of artificial respiration, Schäfer's and Silvester's, depend for their efficacy on the elastic recoil of the chest wall and diaphragm, which occurs only when the muscles of respiration have maintained their tone and integrity. The weak points in Schäfer's method have been described by Eve (1943). In the deeply unconscious patient, whether his state is due to drowning, electrocution, or general anæsthesia, the elastic tone of the respiratory muscles fails progressively. Barclay has shown by radiography that in the prone position the diaphragm is pushed up into the full expiratory position. This will be accentuated in a toneless body. Silvester's method will also fail in the moribund person, in whom the intercostal muscles have lost their tone. Both the methods break down because they are directed towards helping expiration rather than inspiration. When the tone of the respiratory muscles is partially or completely lost, the thorax must be in the position of expiration. Hence a simple method which actively brings the chest into the position of inspiration should be effective. One should aim at expanding the chest rather than squeezing the already contracted lung.

THE METHOD

Experimenting on warm cadavers and on patients under deep general anæsthesia, I found that by pulling on the lower costal margins in an upward and outward direction with hooked fingers of both hands the chest can be made to assume the raised position of inspiration. Release of the pull, coupled with gentle pressure on the lower ribs with the palms of the hands, is quite sufficient to bring about expiration.

If the patient is on a bed or on an operating-table lying on his back, the operator stands at the head end and places the palms of the hands on the lower part of the chest, the middle fingers being on the anterior axillary lines. The fingers are hooked round the lower costal margins on both sides. The pull is made in an upward and outward direction, thereby raising the anterior portions of the ribs as well as widening the lower costal arches. After a steady pull for 3 seconds the pull is released and the chest is gently pressed downward and inward, while the extended fingers exercise the same pressure on the abdomen. Doing this about 12–15 times a minute brings about a respiratory exchange of over 7000 c.cm. of air. In addition, the expansion of the chest and outward stretching of the diaphragm, owing to the widening of the lower costal arches, helps the venous return of the blood.

If the patient is in the face-down position, the operator stands as before, but his hands are brought underneath the chest and the lower costal arches are pulled upwards and outwards.

I had the opportunity to give an extensive trial to this method in the following case of cerebral hæmorrhage.

The patient was deeply comatose and had Cheyne-Stokes breathing. His pulse was slow. In half an hour his breathing stopped, and his pulse could not be felt. I tried the above method of artificial respiration, never hoping to bring back the pulse, but to my surprise the pulse at the wrist returned after three or four attempts. Respiration was not restored, so artificial respiration was continued. For purposes of comparison one of the surgeons tried the Silvester method, but found it much less effective because the respiratory muscles were toneless. The patient was kept alive for 6 hours, including a period of operation lasting for over an hour, by this method of artificial respiration alone; after that he was put in a mechanical respirator. I observed that whenever artificial respiration was stopped for a few seconds his pulse began to fail, showing that the method helps to restore the circulation as well. The surgeons and the anæsthetists of the hospital were satisfied with the efficacy of the method.

EFFICIENCY OF THE METHOD

Cordier (1943) lays down three requirements for judging the efficiency of any method of artificial respiration.

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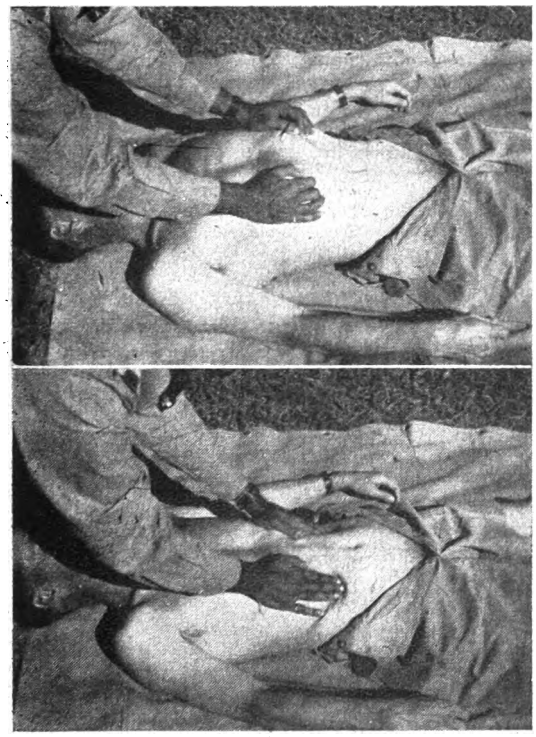
It must give sufficient pulmonary ventilation for a normal subject at rest; stimulate the heart and circulation to transport oxygen to the tissues; and be harmless in itself, easy of execution, and rapid in attaining results. In order to satisfy the first criterion I experimented on a patient under deep anæsthesia with the help of Captain Forrest the anæsthetist, and Captain Bose. The muscles



Method in use: (a) inspiratory position; (b) expiratory position.

were relaxed and the man had almost stopped breathing. The air expelled by pressure on the lower ribs after the inspiratory pull on the costal margins was collected in the rebreathing bag of a Boyle's apparatus and measured. This was compared with the amounts collected by Schäfer's and Silvester's methods. The average results were as follows.

Schäfer's method	278 c.cm.
Silvester's method	425 ,,
New method	836 ,,

The considerable difference in ventilation is evidently due to the fact that the new method assists both the inspiratory and the expiratory processes.

I believe the method also satisfies Cordier's second requirement. In the case reported above the pulse returned to the wrist after three or four attempts at artificial respiration. During the process the tips of the hooked fingers of the left hand of the operator press on the left side of the diaphragm, and so probably stimulate the heart mechanically. The venous return to the heart is aided by increased negative pressure produced inside the chest during inspiration.

The method is harmless and easy to execute, and is particularly convenient when respiration becomes suspended during anæsthesia, since it causes little disturbance to the patient.

SUMMARY

A new method of artificial respiration is described in which inspiration is encouraged by intermittent traction, upwards and outwards, on the costal margin.

The method also helps the venous return, and puts less strain than other methods on the operator.

My thanks are due to the surgeons and anæsthetists of the General Hospital for allowing me to give an extensive

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HIGH BLOOD-PRESSURE AFTER BATTLE

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CAPTAIN RAMC

IN 1920 Alvarez, in an examination of the blood-pressure of 2930 healthy male students, found that the mean systolic pressure for men of 16–40 years was 126·5 mm. Hg, ranging from 90 to 175 mm., with half the sample giving figures between 116 and 136 mm. Hg. He pointed out that 50 out of 100 men (in America in 1920) died of some cardiovascular or closely related disease, and suggested that a systolic blood-pressure of 140 mm. Hg in a young man is indicative of a "hypertensive diathesis." Treadgold (1933) found that of Royal Air Force pilots examined between 1927 and 1931 2% had blood-pressures over 140/90 mm. Hg; the effect of hot climates was to reduce slightly the average pressure (average pressure of pilots at home 125/77, abroad 122/76 mm. Hg), but 308 pilots in Egypt had the same blood-pressure as the home average. According to Gilchrist (1940) hypertension may be described as balanced if the systolic pressure is equal to the diastolic pressure × 1·7, and divergent if it is greater than this. The latter type of hypertension is common in young people in states of excitement or hyperthyroidism. It is, however, unlikely that long-continued emotional tension can of itself be the sole factor in determining persistent diastolic hypertension.

Bramwell (1940) considers that any systolic pressure up to 150 mm. Hg is acceptable as normal. Sorapure (1918) analysed the findings in 769 soldiers in training, and gave figures with a range of 105–135 mm. systolic and 70–90 mm. diastolic pressure. In 1000 healthy civilians of 15–40 years Woley (1910) found an average systolic pressure of 125 mm. Hg; Symonds (1923) found an average systolic pressure of 124 mm. Hg in 100,000 people aged 20–40 years of normal build, and an average diastolic pressure in 60,000 people of 80–83 mm. Hg; he thought that pressures of 155/94 mm. Hg and over indicated danger. Fisher (1914), from an analysis of 4000 people aged 20–40 years, gave the average systolic pressure as 124·5 mm. Hg, while Smith (1918) examined 400 recumbent fit men, age 19–39 years, and obtained average figures of 127/84 mm. Hg, with a range of 119–132 systolic and 80–88 diastolic.

It seems clear, then, that a fit man of normal build within the age-limits of 18–40 years should have a blood-pressure not exceeding 155/95 mm. Hg, and that most samples examined will give a mean reading of about 125/82 mm. Hg. Any diastolic pressure of 100 mm. Hg or over may safely be termed hypertensive.

PRESENT INVESTIGATION

The object of the investigation now reported was to ascertain if a minimum period of one year of active warfare had any deleterious effect on the physical well-being of the troops engaged. It was decided to select representative samples of all ranks and services of an Armoured Brigade of considerable experience in Western Desert campaigning, and to record the resting blood-pressure, pulse, and hæmoglobin readings. In this way it was hoped to form an estimate of the state of the blood and cardiovascular system as an indicator to the general physical state of "fit" personnel.

Hæmoglobin was estimated with an uncalibrated Sahli hæmoglobinometer, the pulse was felt at the wrist, and the blood-pressure was taken with a good mercury manometer in the supine position after 5–8 minutes' rest in the shade, the lowest of three readings being recorded. Day temperatures were about 80–85° F in the shade and the subject was exposed to a draught while resting. The level of diastolic blood-pressure was that recommended by the British opinion of the Anglo-

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trial to this new method on their cases. I am indebted to the O/C an I.G.H. for allowing me to experiment on an anæsthetised patient, and to Captain Forrest and Captain Bose for their assistance.

REFERENCES

Cordier, D. G. (1943) *Brit. med. J.* ii, 381.
Eve, F. C. (1943) *Ibid.* i, 35.
Schäfer, E. A. (1906) *Harvey Lect.* p. 223.

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US committee on the measurement of arterial blood-pressure (*Brit. med. J.* 1939, ii, 184). All subjects were fit for duty, medical category A, and had not "been sick" for four weeks. Officers, NCOs, and men were tested impartially; all were familiar with the examiner and were reassured before examination. In general their attitude was one of mild interest; no-one appeared to be excited. The men were used to routine medical inspections, were long familiar with their doctor, and had neither hopes nor fears about the outcome of the test.

The survey began on May 28 and finished on June 28, 1943. It was made on 695 men between the ages of 20 and 38 years, of average height and body-weight, and was conducted at a training area in Tripolitania 4–8 weeks after battle had ceased. All the men had served for a year in active field operations, the vast majority for 2–3 years; many had been in the Middle East for continuous periods up to 5 years. Local conditions at the time of testing were good, with sea-bathing and organised sports and entertainment. Training programmes were light and no exercise was taken within an hour of examination. Diet had been supplemented with bread, a little beer, and some vegetables.

RESULTS

The blood-pressure readings in the 695 men were as follows—

Mean blood-pressure of total sample, 154/90 mm. Hg $\pm \frac{0{\cdot}867}{2{\cdot}206}$ (SE)

Number of hypertensive cases (diastolic 100 mm. Hg), 187.

Mean blood-pressure of hypertensive group, 178/114 mm. Hg ±1·729/0·916.

Mean blood-pressure of normal residue, 146/81 mm. Hg ±1·382/1·212.

Of the whole group, 26·9% had a diastolic pressure of 100 mm. Hg or over, and 38% had a systolic pressure of 160 mm. Hg or over. The mean pressure of these cases was of the balanced type of hypertension, suggesting that the observed results were not due to immediate excitement.

The resting pulse-rates ranged from 50 to 116 per minute, with a mean figure of 74 ± 3·2. Well-marked sinus arrhythmia was noted in 5·1% of the whole group.

Of the 187 hypertensive cases, the urine was tested in 125; 3 cases had albuminuria and were sent to hospital. Only 21 of the 187 cases complained of any symptoms, which took the form of headaches, palpitation, and dizzy spells or "black-outs" on bending down or on first rising in the morning. It was possible to re-examine 33 of the cases with a diastolic pressure of 100 mm. Hg or over after two months during which local conditions remained the same but the prospect of further battle had temporarily receded. It was found that 28 cases had partially returned to normal so as to have a mean blood-pressure of 157·7/92·1 mm. Hg.

The majority of the hæmoglobin figures were normal; 27 out of 245 measured had a reading of 90% or less on the Sahli scale, while 60 men (24·5%) gave a reading of 110% or over, the maximum being 130%. Of these 60, 13 had a diastolic pressure of 100 mm. Hg or over, and a resting pulse-rate of over 100 per minute. There did not appear to be any constant relationship between high hæmoglobin readings and hypertension.

DISCUSSION

The hypertension among this sample of troops resting after battle may have been of renal or of neurogenic origin, dependent on (*a*) long subsistence on battle rations; (*b*) "desert life" (i.e., dust, movement, dehydration, lack of proper rest, frequent physical strain); (*c*) "battle strain" (i.e., a degree of anxiety neurosis or the result of frequent maximum physical effort with an attendant anxiety factor).

The food factor is unlikely to have been important, for the rations were well balanced and did not differ substantially before and after the test was carried out except perhaps in palatability. There was little concrete evidence of kidney damage among the hypertensive cases, but as Goldblatt and others (1934) have shown it is possible to produce a persistent high blood-pressure of renal origin although there is no evidence of renal disability in the urine. Dehydration was a persistent feature of campaigning life in the desert, with a high incidence of hæmorrhoids, varices, and calculi. Treadgold (1935) found no difference between the blood-pressure of fit men in the United Kingdom and in Egypt, but his subjects would not be suffering from physical or mental strain or dehydration. His psychoneurotic cases had normal blood-pressure, so a mild degree of anxiety neurosis would seem unlikely to affect the pressure.

For days on end men taking part in a big battle show evidence of hyperadrenalinæmia, with a fast pulse, pale face, and enlarged pupils, even when there is no immediate danger. This is more obvious in morally strained or battle-weary troops and if often repeated and long-continued might cause persistent hypertension through overaction of the suprarenals or hypertrophy of the medial coat of the arteries (McDowall 1941). The tendency shown by a large proportion of the few cases re-examined after 2 months' rest to return towards normal blood-pressures, though there had been no change in climate, diet, or dehydration but personal anxiety had been relieved, favours a neurogenic origin of the hypertension.

SUMMARY

In a sample of 695 men from an Armoured Brigade who had experienced at least a year of desert warfare resting pulse-rate, hæmoglobin, and blood-pressure were recorded.

A symptomless hypertension was found in 187 cases (27%). When 33 of the hypertensives were re-examined after 2 months' freedom from battle anxieties, 28 showed a normal pressure.

My thanks are due to the staff of the Oxford Institute of Social Medicine who lent their apparatus and their skill in statistical evaluation of the results.

REFERENCES

Alvarez, W. C. (1920) *Arch. intern. Med.* **26**, 381.
Bramwell, C. (1940) *Lancet*, i, 138.
Fisher, J. (1914) *J. Amer. med. Ass.* **63**, 1752.
Gilchrist, A. R. (1940) *Edinb. post-grad. Lect. Med.* **2**, 70.
Goldblatt, H., Lynch, J., Hanzal, R. F., Summerville. W. W. (1934) *J. exp. Med.* **59**, 347.
McDowall, R. J. (1941) *Brit. med. J.* ii, 75.
Smith, B. (1918) *J. Amer. med. Ass.* **71**, 171.
Sorapure, V. E. (1918) *Lancet*, ii, 841.
Symonds, B. (1923) *J. Amer. med. Ass.* **80**, 232.
Treadgold, M. D. (1933) *Lancet*, i, 733.
Woley, H. P. (1910) *J. Amer. med. Ass.* **55**, 121.

EXCORIATION AROUND FISTULÆ
CONTROL BY BUFFERED GELS

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IN operations involving the alimentary tract or pancreas, it occasionally happens that leakages of fluid containing proteolytic enzymes cause excoriation of the skin around the wound or drainage-tube. Such digestion and irritation, if long-continued, is very distressing to the patient. We have observed that until the leakage of digestive fluid ceases, and so the prime cause is removed, the application of standard preparations, ointments, or lotions to the skin is of little value.

By identifying the principal protease present in the exudate, which is presumably responsible for digestion of the skin, it has been found possible to apply a solution buffered at a carefully selected pH such that the proteolytic action is destroyed or reduced to a minimum and which is at the same time compatible with wound healing.

The proteases with which we have had chiefly to deal have been the "pepsin" complex from wounds of the stomach, and the "trypsin" complex from operations on the small intestine, pancreas, or large bowel. In the former case pepsin has an optimum pH of 1·5 to 2·0 and is inhibited above pH 5·0 (Northrop 1931); cathepsin is also associated with gastric juice and probably with most tissues, and this has an optimum pH between 4 and 5, and has no action above pH 7·0. It follows, therefore, that a buffered solution on the alkaline side of neutrality will effectively minimise proteolytic activity arising from such fluid. We have used a pH of 8–8·5 with success.

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In the case of fluids containing the tryptic complex of enzymes, an optimum pH for the digestion of proteins and of primary cleavage products is found around pH 7·8 and the activity is negligible on the acid side of pH 5·4 (Seth 1924). In such cases, therefore, an acid buffer of pH 5·0 bathing the skin should prevent excoriation, and this has been found successful.

The application of dressings soaked in these buffered solutions is not practicable, for most of the solution is lost by soaking away and by evaporation. However, the addition of a suitable inert non-toxic agent to the buffer solution, causing it to form a gel, greatly reduces the loss of solution from both these sources and at the same time brings the buffer into intimate contact with the affected surface. Experiments quoted below show that the buffering power of the solutions is augmented by the addition of the gelling agent.

PREPARATION OF SOLUTIONS AND GELS

(*a*) *Buffer solution pH* 5·0.—10·207 g. of potassium hydrogen phthalate is dissolved in water, 23·90 ml. of 1 N.NaOH solution is added, and the volume made up to 1 litre. To this 5 g. of chlorbutol is added to prevent the growth of bacteria and moulds. The resulting solution has a pH of 5·0 measured by the glass-electrode and forms the basis of all the acid-gels used.

(*b*) *Gelatin buffer pH* 5·0.—75 g. gelatin is warmed with some of solution (*a*) until dissolved and the volume made up to 500 ml. with solution (*a*). The warm solution is saturated with chlorbutol crystals; a firm gel having a pH of 5·0 to 5·1 forms on cooling. Variations of this gel using 10% gelatin and 5% agar have been tried, as has a mixture of 20% starch and 5% gelatin.

(*c*) *Potato buffer-gel.*—Owing to the relative scarcity of many of the ingredients of (*b*) a cheap and easily prepared product has been devised from potatoes, required only 3% gelatin. About 500 g. of peeled washed potatoes are autoclaved at 30 lb. pressure for an hour. They are then mashed and 300 g. of the mashed material is stirred into the warmed solution (*a*) and 15 g. of gelatin added with some excess chlorbutol. The volume is made up to 500 ml. with the buffered solution. This mixture is then sterilised at 15 lb. pressure and while hot is pumped through a sterile laboratory homogeniser. (An ordinary domestic "cream-making" machine will serve as well.) The resulting thick cream has a pH of 5·0 to 5·2. This gel has a tendency to separate out and should not be kept for more than a fortnight.

(*d*) *Congo red and polyvinyl alcohol gel.*—Recently an entirely new medium for these buffer solutions has been developed. In this the gel-forming properties of polyvinyl alcohol solution when combined with certain cross-linking agents is used. A 1% Congo-red solution in buffer solution pH 5·0 is added to an equal volume of 10% polyvinyl alcohol in buffer pH 5·0 at 50–60° C. On cooling, a clear red gel is formed having a pH of 5·0 to 5·2. It is extremely stable and may be sterilised by autoclaving at 15 lb. pressure without alteration of pH or gelling power.

(*e*) *Buffer solution pH* 8·0.—6·808 g. potassium dihydrogen phosphate is weighed out and dissolved in water, 23·4 ml. of 2 N.NaOH is added and the volume made up to 1 litre. The pH of this solution is 8·0 at 20° C, and it is used in the preparation of all the alkaline buffer gels.

(*f*) *Gelatin buffer gel pH* 8·0.—The preparation of this is similar to (*b*) but the buffer pH 8·0 is used. It is necessary to add 12·0 ml. of 2 N.NaOH to bring the pH to 8·0 owing to the acidity of the gelatin. This alkaline gelatin undergoes slow hydrolysis and should be used within 14 days of preparation. A cheap form of alkaline gel similar to (*c*) has been attempted but is unstable.

(*g*) *Borax and polyvinyl alcohol gel.*—15 g. polyvinyl alcohol is dissolved in 300 ml. of solution (*e*) by warming to 60–70° C. To the warm solution is added 5 g. borax dissolved in 200 ml. of the buffer solution and the mixture is well stirred. Gelation is almost immediate. The resulting gel is firm and stable and may be sterilised at 15 lb. pressure. The pH is 8·5 to 8·6.

COMPARISON OF BUFFER POWERS

To assess the power of the various preparations to resist changes of pH due to addition of acid or alkali a modification of the original unit of buffer power (van Slyke 1922) was used.

To 100 ml. of the given buffer gel, liquefied by warming, small measured volumes of 1 N.HCl or 1 N.NaOH were added. After shaking, the liquid gel was poured into the electrode chamber of the pH meter and the pH measured when cooled to room temperature. A curve having for ordinates the pH and for abscissæ the milliequivalents of H· or OH′ added was thus constructed. For the acid series of gels the mean milliequivalents of alkali required to change 100 ml. of gel from pH 5·0 to pH 6·0 was read off from the graph, and this figure is used in assessing the buffer power of the preparation. Similarly for the alkaline series the mean milliequivalents of acid required to change the pH of 100 ml. of the gel from pH 8 to pH 7 was found.

BUFFER POWER OF GELS

Buffer	pH	Constitution	Mean B* (pH 5–6)
Solution (*a*)	5·00	Aqueous potassium hydrogen phthalate	2·0
Gel (*b*)	5·00	15% gelatin in (*a*)	4·2
Gel (*c*)	5·00	3% gelatin + 60% potato in (*a*)	2·5
Gel (*d*)	5·00	5% polyvinyl alcohol + 0·5% Congo red in (*a*)	2·1
Solution (*e*)	8·00	Aqueous potassium dihydrogen phospate	(pH 8–7) 1·5
Gel (*f*)	8·00	15% gelatin in (*e*)	2·0
Gel (*g*)	8·60	3% polyvinyl alcohol + 1% borax in (*e*)	2·3

* B = milliequivalents of H· or OH′ per 100 ml.

As will be seen from the table, the buffer powers of the solutions are in every case increased by the addition of the gelling agents. This is most definite in the case of gel (*b*) on account of the acid protein nature of gelatin.

The plain gelatin gels suffer from one disadvantage—a tendency to liquefy at body temperature. Variations using 5–10% of agar in addition were tried and overcame this difficulty.

Undoubtedly on both the acid and the alkaline side gels utilising polyvinyl alcohol are to be preferred since they combine many excellent properties. Polyvinyl alcohol solutions, and gels derived therefrom, are chemically very stable and can be sterilised by autoclaving, are non-toxic, non-irritant, and bacteria and moulds do not grow in them. The material is manufactured by E. I. du Pont de Nemours of USA and is not readily available here at present. It is a vital material in the plastics industry and larger supplies will probably be forthcoming soon. We would emphasise, however, that it is the buffer solution controlling the pH and not the vehicle that is the active agent in these treatments, and that the other gels described are satisfactory.

ILLUSTRATIVE CASES

1.—Male, aged 46. Operation for perforated duodenal ulcer. After 5 days a green discharge from lower end of wound excoriating the surrounding skin caused much discomfort. Fluid: alkaline, trypsin ++, amylase +. Gelatin buffer gel pH 5·0 applied. Excoriation rapidly subsided and irritation ceased; discharge gradually stopped and incision healed after 28 days.

2.—Male, aged 73. Carcinoma of rectum. Laparotomy and pelvic colostomy. After 12 days a chronic mucous discharge began, giving rise to a large area of excoriation around the wound. Discharge: pH 8·6, trypsin ++. Gelatin buffer gel pH 5·0 applied to whole area. The preparation was varied, using 30% starch/3% gelatin, and 10% agar/30% starch gels of pH 5·0. The excoriation slowly subsided and discomfort was relieved.

3.—Male, aged 50. Duodenal ulcer. Posterior Polya gastrectomy. Slight discharge causing excoriation developed after 4 days. Fluid: pH 7·4, trypsin +, amylase ++. Gelatin buffer gel pH 5·2 applied, and excoriation subsided in 7 days. Fluid flow gradually ceased and wound healed up after 18 days.

4.—Male, aged 68. Carcinoma of œsophagus. Gastrostomy performed and catheter inserted. After 6 days there was considerable excoriation and soreness of the skin around the tube. Fluid regurgitated from tube contained free HCl and pepsin and had a pH 5·0. Area around tube was dressed with a buffer gel of 10% gelatin and 5% agar at pH 8·0. Soreness and excoriation rapidly diminished.

5.—Female, aged 50. Fæcal fistula following hemicolectomy caused extensive excoriation. Fluid: faintly alkaline,

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trypsin ++, amylase faintly positive. Potato gel pH 5·2 was used as a dressing and the condition improved rapidly and was almost clear in 7 days. Treatment with the same gel was continued but excoriation recurred after 16 days. A sample of the gel examined showed pH 4·7 and it is probable that the increased acidity was responsible for the relapse. Testing a sample of potato buffer gel at intervals shows that it should not be used for longer than 14 days after preparation on account of slow production of acid. Unfortunately this case was transferred and it was not possible to continue the treatment with fresh gels.

6.—Female, aged 62. Biliary fistula following cholecystectomy. An erythematous area appeared around the opening with considerable soreness. Fluid: pH 5·3; bile-salts, pus cells, and a trace of blood present; trypsin negative, pepsin negative. The area was dressed with polyvinyl alcohol buffer gel pH 8·5. The soreness was relieved and after 3 days the skin was clear; the treatment was continued until the fistula closed up.

DISCUSSION

The clinical trials have shown that discomfort and excoriation due to proteolytic enzymes may be successfully overcome by pH control along the lines indicated, and case 6 suggests that it is sometimes possible to use the method in conditions for which digestive enzymes are not demonstrably responsible.

Davidson (1925) and Legroux and Loiseleur (1941) have suggested that the toxæmia of burns and septic wounds is partly due to absorption into the circulation of protein cleavage products from the autolysis of tissues. This autolysis is chiefly caused by the enzyme cathepsin, which is active in slightly acid media, and the rational treatment would seem to be to minimise its activity by shifting the pH to the alkaline side where the enzyme is inhibited. This is the original basis of bicarbonate baths and compresses in the treatment of burns. The use of buffered gels for this type of treatment is now under consideration.

SUMMARY

The preparation of acid and alkaline buffered gels is described and their relative buffer powers have been measured.

By using such gels of the appropriate pH, excoriation of the skin by proteolytic enzymes has been successfully treated.

It is suggested that the same principle might be applied to the reduction of tissue autolysis in burns.

We wish to thank the surgical staff of this hospital for their coöperation, and the Medical Research Council for a grant which made this work possible.

REFERENCES

Davidson, E. C. (1925) *Surg. Gynec. Obstet.* **41**, 202.
Legroux, R., Loiseleur, J. (1941) *Bull. War Med.* No. 3.
Northrop, J. H. (1931) *J. gen. Physiol.* **14**, 713.
Seth, T. N. (1924) *Biochem. J.* **18**, 1401.
van Slyke, D. D. (1922) *J. biol. Chem.* **52**, 525.

Reviews of Books

Mosquito Control

(2nd ed.) W. B. HERMS, H. F. GRAY. (Oxford University Press. Pp. 419. 20*s*.)

THERE are more than 1400 described species of mosquitoes, and since their habits, noxious and otherwise, are almost as varied, it is not surprising that scientific mosquito control is a complicated business. Its importance hardly needs stressing, but it is a little surprising to learn that there were 1½ million cases of malaria in the United States in 1932—when the disease was considered to be at a low ebb. Herms and Gray naturally approach mosquito control from the point of view of their American experience; thus, their chapter on the education of the public will be of little direct help to the worker in primitive places. Yet here, as elsewhere in the book, the reader who extracts the general principles and applies them to his own situation will find much which is helpful. Control by drainage, flushing of streams, oils and larvicides, fish, and screens and nets are all dealt with in detail. It is suggested that DDT may in due course replace pyrethrum, except possibly in aerosol sprays. The sections on control in rural and urban areas again approach the situation from a primarily American standpoint, with much emphasis on cemetery urns, duck clubs, and ornamental garden ponds. There is a useful appendix on mosquito identification.

Textbook of Surgical Treatment

(2nd ed.) C. F. W. ILLINGWORTH, MD, CH M EDIN., FRCSE. (Livingstone. Pp. 564. 30*s*.)

IN this second edition the chapter on burns has been rewritten to incorporate the work of Colebrook in Glasgow, so that it now conforms to modern ideas. The use of plasma to restore proteins in the stage of shock is noted, but there is no mention of the administration of large volumes of M/6 sodium lactate solution by mouth for the same purpose. The rest of the book is largely unchanged.

There are not sufficient technical details for the book to be of use to those undergoing training in surgery, but senior students reading it will get their values right and gain a sound outlook.

What is Hypnosis?

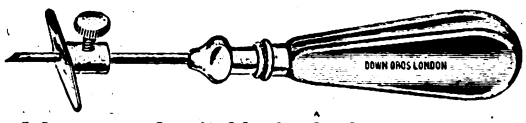
ANDREW SALTER. (Richard R. Smith. Pp. 88. $2.)

THE theme of this essay is that "hypnosis now remains merely a term of convenience. It is all conditioning, and when this is constantly kept in mind hypnosis, or conditioning, becomes an instrument of the most fantastic power, and the person under treatment needs neither faith, nor hope, nor confidence for satisfactory psychotherapy." The writer is a successful hypnotist, ignorant of the objections against explaining every habit and every instance of learning as due to "conditioning," but familiar with some recent scientific writings, such as Hull's on the psychology of hypnosis. He describes his methods of teaching "autohypnosis"—a process which enables the subject to make himself deaf to all noises but the hypnotist's voice and otherwise reduce his field of awareness ("one of my subjects ... hypnotizes herself as she rides to school from the suburbs in a trolley car each morning.") He advocates training on these lines for soldiers, since he has produced by hypnosis deafness to air-raid noises played on the gramophone. Fanciful proposals, uncritical explanations, descriptions of skilled technique, and sensible reasons for rejecting claptrap are curiously juxtaposed.

New Inventions

NEEDLE FOR MARROW PUNCTURE AND INFUSION

MARROW puncture and infusions are now an accepted part of modern medicine. The complexity of some of the needles used, and there unsuitability for both diagnostic and transfusion purposes, has led to a search for a more satisfactory design. The needle here described has proved suitable for both procedures, while being simple in construction.



The length of the needle has been reduced to a minimum, to prevent obstruction of the patient's vision and mouth when introduced sternally, and the butt has been made as small as practicable to prevent the needle becoming top-heavy. The bore is of Record fitting and has been made for use with standard blood-transfusion apparatus and equipment. The adjustable guard with slender wings enables the needle to be inserted at whatever angle the operator desires, and prevents too deep an insertion. The needle may be held firmly in the final position by a strip of adhesive plaster over the wings. A handle is provided to assist control and ease of introduction.

The needle has been made for me by Messrs. Down Bros.

My thanks are due to the Director-General of Medical Services, Royal Air Force, for permission to publish this note. I am also indebted to the Commanding Officer and my colleagues at an RAF hospital, and to Mr. W. Middleton and Mr. Cook of an RAF maintenance unit for making numerous trial patterns.

E. M. DARMADY, MB, MRCP
Squadron-Leader RAF.

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THE LANCET

LONDON: SATURDAY, FEBRUARY 24, 1945

Penicillin in Compound Fractures

THE fourth to the ninth day has come to be looked on as the golden period for wound closure. Thus "delayed primary closure" proved its value in soft-tissue wounds in Italy, and with penicillin to relieve the surgeon's anxiety about sepsis the principle has been extended to the open fracture. In this issue BURNS and YOUNG in England and BENTLEY and his colleagues in the CMF show how amazingly successful penicillin and early closure can be, confirming the Canadian results summarised by MACFARLANE in our issue of Feb. 3. The Botleys Park surgeons have treated 70 open fractures of the femur with no deaths, no amputations, and a maximum shortening of half an inch; they anticipate that 50 of the 70 will have normally functioning limbs within nine months. BENTLEY and his colleagues have treated 62 open fractures of other bones, obtaining primary union of flesh and bone in 58. There is an obvious temptation to go one better—to advocate primary suture at the first operation. Penicillin should theoretically make this possible, and BURNS and YOUNG nod their approval. But this temptation should be resisted. It is not always possible at the primary operation to tell the living from the dead. As CHURCHILL[1] points out, at this stage "recognition of all devitalised tissue is oftentimes impossible . . . disturbances of blood-supply and subtle changes that indicate impending death of tissues may not be detectable." Moreover, after wound excision local oozing is inevitable, and penicillin cannot reach the inside of accumulated blood-clot. Packing the wound for a few days will allow this exudate to escape. Clearly then, primary closure carries an unjustifiable risk. To wait longer than the ninth day, on the other hand, results in the tacking down of the flaps, which lose their elasticity, and allows the skin to organise in the position of slack; to suture the skin then is a formidable operation, necessitating much undercutting. Every day after the fourth gives infection a greater chance to assert itself. Partial suture, as BENTLEY and his colleagues emphasise, is not enough—it still leaves an aditus for infection—so every attempt should be made to close the skin completely, if necessary by cutting flaps or immediate skin-grafting. Any necrotic tissue must be excised before suture, and CHURCHILL from his extensive experience with the CMF declares that the leaving of such dead or avascular tissues behind is almost solely responsible for the failures; to that BENTLEY and his colleagues add the retained foreign body in the fracture area. BURNS and YOUNG have found it safe to suture on clinical grounds alone. "Count your blessings one by one"—no brawny œdema, no gross sloughing, pus minimal. This does not absolve us from taking wound swabs, for if anaerobic organisms are found they are an indication for a longer course of penicillin. BURNS and YOUNG maintain that with such suture gram-negative infection of the wound can be ignored, since the body can cope with it, and the CMF surgeons have also been little troubled by coliforms and *Ps. pyocyanea*; but their technique allows pus to be aspirated off.

There is still difference of opinion as to the virtues of local application. BURNS and YOUNG gave their penicillin parenterally, and they contend that local application may lead to formation of sinuses. In time of war, once the patient leaves the theatre, we naturally try to avoid interference with the wound, and local injections by tube must carry some risk of implanting new organisms: MCKISSOCK and his colleagues[2] have demonstrated how difficult it is to exclude secondary invasion along tubes. No locally injected penicillin will find its way into the crevices of the fissured and splintered bone, and it cannot be counted on to run between packed muscle layers. Systemic administration of 15,000 units three-hourly gives a local concentration in the wound fluid of 2 units per c.cm., and 0·1 unit per c.cm. is said to be adequately bacteriostatic. But BENTLEY and his colleagues, who used local therapy alone or with parenteral injections, rightly point out that only by local therapy can dead tissue be thoroughly soaked in the chemotherapeutic agent: where transport difficulties make the wounded come for operation late, and full excision is not always possible, local penicillin thus has its place. They point out too that though 17% of the staphylococci found in their wounds were penicillin-resistant, the organism would still respond to high concentrations of penicillin, such as could be introduced by local measures. GARROD,[3] on the other hand, thinks that nothing is gained by aiming at very high local concentrations. Where there are associated joint wounds penicillin led through tubes to within half an inch of the joint has advantages, for systemic penicillin will not diffuse into the joint space.

From the point of view of the fracture, the results obtained by BURNS and YOUNG, using below-knee pin-traction and early movements, are remarkably good. Others are claiming equally good results from plaster immobilisation. It has been well said that the successful treatment of a fractured femur depends more on the surgeon than the method. The below-knee pin is certainly highly successful in the routine treatment of the simple fractured femur. The use of "pumping" movements, when pus is present, hardly has textbook approval, but BURNS and YOUNG believe that this unorthodox method is justified by results. The movements they allow are active movements, and pain will prevent the patient tearing his healing tissues.

Altogether we have every reason for satisfaction with the progress in treatment of this severe injury. Penicillin has made infection no longer inevitable in war. As BURNS and YOUNG point out, it may not ensure local sterility or clean healing, but it does ensure that the patient will not die of septicæmia, and relieved from that fear the surgeon can do in the early days of a compound fracture what without penicillin he would not dare to do for months, if at all. But those concerned with the policy of penicillin usage are to be congratulated on having early realised that penicillin was no excuse for delaying or skimping surgery. Like all other chemotherapeutic agents it

1. Churchill, E. D. *Ann. Surg.* 1944, 120, 265.

2. McKissock, W., Logue, V., Bartholomew, I. *Brit. med. J.* 1944, ii, 551.

3. Garrod, L. P. *Ibid*, Jan. 27, 1945, p. 107.

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cannot sterilise dead devitalised tissues. The knife is still the touchstone for success. The need to revere skin, and to deliberate before excising any millimetre of it, has been generally recognised. The need for resting the tissues, especially in the early critical days after excision, is no less important. To the surgeons in the forward area who do the first wound excision, rather than to penicillin, is due the main credit for the success of delayed primary closure, and both reports pay tribute to these young surgeons for the thorough primary surgery they have been doing. If we may borrow a phrase from GORDON-TAYLOR,[4] "*Macte virtute, puer esto*. Well done, young man!"

Traumatic Anuria

FOUR years ago, when the first papers appeared on crush syndrome in air-raid casualties, it was stated that "crush injuries are not new. They are commonly seen on the coalfield, where the treatment is careful nursing and non-interference rather than physiological and biochemical assay."[5] Apparently, however, no such cases had been recorded, and the only previous accounts of the condition were in German descriptions of military casualties of the last war, together with some cases retrospectively diagnosed which were reported in the Messina earthquake in 1910. It was expected that recognition of the crush syndrome in 1–5% of air-raid casualties would lead to its recognition in mining accidents: yet so far only 2 cases seem to have been recorded from mines, one by MCCLELLAND from Canada[6] and the other by A. CAPLAN and G. E. DUNKERLEY from India in our issue of Feb. 3. Discussing the reasons for the apparent rarity of the syndrome in miners CAPLAN and DUNKERLEY remark that it may not be diagnosed—and indeed it often remains undiagnosed even in London air-raid casualties. But they also think that it is genuinely uncommon; for in eight years' experience of accidents in underground workers they cannot recall a previous case of renal failure associated with limb injury. Where falls of stone occur, the miners are either dead when released or die immediately afterwards from other injuries.

Anuria, however, sometimes develops after traffic or industrial accidents, or war wounds, without any long-continued compression. In many of these cases it is hard to know whether the failure to pass urine is due to intravascular hæmolysis, to sulphonamide lesions of the kidney or ureter, to plain dehydration through loss of fluid with inadequate replacement, or to ischæmic muscle necrosis as in "crush syndrome" proper. Many severely injured patients are given sulphonamides and blood-transfusion; many vomit; some do not get enough fluid; and some suffer gross exsiccation because of a not easily displaced (however profoundly misplaced) belief on the part of nurses, and also of doctors, that the more hot-water bottles, electric blankets, radiant-heat cradles, and stoves-under-the-bed are applied to the shocked patient, the better for his "shock." To sort out these various possible causes in any given case, close clinical observation is necessary, and often laboratory or autopsy evidence as well—data that may be difficult to collect under the urgent conditions of military surgery. The series of 8 cases reported in this journal last December by DARMADY and his colleagues[7] illustrate well the difficulties encountered. After blood-transfusion, performed on the third day in case 1 and the fourth day in case 3, jaundice was noted on the following day, with blood-ureas of 72 and 68 mg. per 100 c.cm. Thus the renal defect found after death on the fourth day in case 1, and manifest in case 3 by a uræmia reaching 408 mg. at death on the seventh day, seems to have developed about the time of transfusion; in view of the relatively low initial blood-urea it can scarcely have preceded it. As the investigators point out, histologically the renal lesion of intravascular hæmolysis is similar to that of ischæmic muscle necrosis, and they can be differentiated only by identifying the respective pigments in blood or urine, by finding bilirubinæmia or jaundice (which follow hæmolysis but not myolysis), by discovering the temporal relationships, or by securing direct evidence of muscle necrosis, incompatibility, or hæmolysis of the donor blood. Another of the cases in this series showed gas-gangrene, which is evidence of primary muscle ischæmia: but though it is known that clostridial infection of the blood-stream produces hæmolysis, with gross hæmoglobinæmia and hæmoglobinuria, none of the 4 cases examined post mortem—including this one—had pigmented casts in the renal tubules. Though 5 of the patients received sulphonamide by mouth, no data are given incriminating this as the cause of the anuria, nor were crystals found in the fatal cases. The authors of the paper refer to claims that changes like those of crush injury are found in injuries without any long-continued compression, and in other conditions such as blackwater fever, pyloric stenosis with vomiting, and septic abortion. They consider that a common ætiological basis should be sought, and suggest that the renal changes may be due to anoxia, secondary to hypotension or vascular spasm or both.

The problem is evidently important, since the above 6 fatal cases accounted for a third of the deaths in hospital of 2000 selected casualties from the French battlefield. It is difficult to see how it can be solved except by observers specially detailed for the purpose, since the clinical and laboratory evidence is to be found chiefly in the very early stages of the renal lesion, and as a rule—in ischæmic muscle necrosis at least—chiefly within the first 24 hours of return of the circulation to the damaged part. Some details of the condition preceding wounding, and essential data such as blood-pressure and fluid intake and output are not beyond routine recording; but even such a simple test as the benzidine or guaiac reaction for the detection of hæm pigments in the urine, needs to be performed by someone conversant with its use. Experience is needed to avoid quite simple fallacies. Thus, if a patient is immobilised on his back, catheter urine may appear free from pigment unless care is taken to express the last few drops, by pressure on the abdomen; if the urine is acid, as is usual after injury, the pigment may be present entirely as precipitate or in casts in these last few drops.

It seems most likely that enlightenment will come from special teams, such as that of COURNAND and

4. Gordon-Taylor, G. *Brit. J. Surg.* 1944, **32**, 247.
5. Harris, H. A. *Brit. med. J.* 1941, i, 491.
6. McClelland, J. C. *Canad. med. Ass. J.* 1941, **45**, 332.
7. Darmady, E. M., Siddons, A. H. M., Corson, T. C., Langton, C. D., Vitek, Z., Badenoch, A. W., Scott, J. C. *Lancet*, 1944, ii, 809.

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her collaborators, working on civil accidents, since these do not differ appreciably from battle injuries except in the rapidity with which they are admitted to hospital: under modern battle conditions it would be difficult even for special observers to use those clearance methods of investigating renal function developed by HOMER SMITH and used by COURNAND et al.[8] The results obtained so far by the latter group indicate that renal blood-flow is reduced during oligæmic hypotension: yet, despite the consequent tendency to anoxia, traumatic anuria is rare in "shocked" patients, and some other or additional factor seems necessary to account for it. If anoxia were the principal or sole factor, one would expect a cortical necrosis of the kidney, hitting first the most highly active tubules of the first convolution. This is only very rarely seen after injury,[9] but has been produced experimentally by SCARFF and KEELE,[10] who cut off the renal blood-supply for an hour or two. In contradistinction, the renal lesion after crush injury and mis-matched transfusion is mostly in the distal convoluted tubule, leaving the proximal ones unaffected.

Restaurant Hygiene

COMMUNAL feeding, already gaining in popularity before the war, has increased rapidly in the war years. British restaurants, factory canteens, meals in schools, the NAAFI, and numerous other war-time establishments, besides the regular restaurants, "help-yourself" and otherwise, are providing millions of meals every day, while the tea-shop and the ever popular public house provide fluid refreshment. The food and drink supplied come from many sources, are manipulated by many hands, and dispensed to many patrons, so public eating- and drinking-places must offer ample opportunity for the spread of infection. Cutlery and crockery, as well as food and drink, may become contaminated with pathogenic bacteria of both respiratory and intestinal origin, derived from patrons themselves or from the restaurant staff. Considering the lack of any proper sanitary control over them, the wonder is that public eating-places have not been incriminated more often as focal points for the spread of infection. Proof of such an origin would in the case of respiratory infections be hard to obtain in view of the multiplicity of other sources. Intestinal infections have from time to time been traced to food-handlers in restaurants, and with extension in the typing of both intestinal and respiratory pathogens the epidemiologist will in future be able to follow infections more often to their source. Cups and glasses, spoons, knives, forks, and plates are all potential vehicles for the spread of infection, and very few restaurants or public bars could satisfy the hygienic standards required to block this particular channel of spread. Although abnormal demands, shortage of staff, and lack of mechanical appliances make it very difficult to effect the necessary reforms in war-time, it will be generally agreed that for æsthetic reasons as well as for protection of the public health satisfactory methods for cleansing and sterilising crockery and cutlery together with a high standard of personal hygiene should be required, and if necessary enforced by law, in public eating- and drinking-places. The medical officer of health and the sanitary inspector now have no real right of entry to catering establishments except to inspect food and its production. The Food and Drugs Act 1938 demands cleanliness of employees in such establishments, as well as of apparatus and utensils, but there is no specific mention, as there is in the United States inspection regulations, of chipped or cracked chinaware, and in effect there is no official supervision of utensils or their cleansing in restaurants.

Much work on the bacterial flora of crockery and cutlery in restaurants and public bars has been done in America, usually by taking multiple swabs from the washed table-ware, and examining for respiratory and intestinal organisms. A common finding has been the atypical coliform *Bact. ærogenes*, which might be used to indicate the quality of dish-washing as typical *Bact. coli* is used as an indicator of water purity. In an investigation of restaurant hygiene in Providence, USA, HORWOOD and PESANE[1] found, inter alia, hæmolytic streptococci in 2 of 184 samples (1·1%) of table-ware, *Staph. aureus* in 5·4%, and *Bact. coli* in 1·6%, while Vincent's organisms and *C. diphtheriæ* could not be recovered from any of the swabs. The investigation was conducted in the summer months and might have yielded a higher incidence of respiratory pathogens in the winter. On another page, LINFOOT records the isolation of *Staph. aureus* from 12, hæmolytic streptococci from 8, and coliform bacilli from 5 of 20 cultures taken from the cracks in cups obtained at various restaurants. Presumably if these pathogens can get into the cracks, they can get out again. His suggestion that the greatest danger from cracked and chipped crockery is the transfer of ulcerative stomatitis may have substance if a virus of the herpes type is a common cause of stomatitis. The spread of Vincent's angina by drinking vessels has often been suggested, but the considerable doubt about the infectiousness of this condition, and the failure to reproduce the infection experimentally in animals, including the monkey,[2] rather negatives the possibility. On the other hand, various detergents have been found not to destroy influenza virus,[3] which, being viable for some time outside the body, may be transferred by unsterilised crockery.

The institution of satisfactory methods of dish-washing should not be difficult. The trouble in most restaurants is that the dish-water is not hot enough to destroy vegetative bacteria, particularly if the washing is done by hand. As a result the dishes are neither properly cleansed nor sterilised. Conditions are much worse in public bars, where glasses are usually given a quick rinse in cold or tepid water containing, perhaps, some magic cleanser. Here the traffic in human saliva and the opportunities for the spread of infection in this way must be considerable. To add to the problem, staff employed in the menial task of dish-washing are often of the lowest grade of intelligence, poorly paid, and woefully ignorant of hygienic needs and standards. But the obstacles to the reform of restaurant hygiene can and must be surmounted. The technique of satisfactory dish-washing is relatively simple. With manual

8. Cournand, A. et al. *Surgery*, 1943, **13**, 964.
9. McFarlane, D. *J. Path. Bact.* 1941, **52**, 406.
10. Scarff, R. W., Keele, C. A. *Brit. J. exp. Path.* 1943, **24**, 147.

1. Horwood, M. P., Pesane, C. P. H. *Publ. Hlth Rep., Wash.* 1942, **57**, 33.
2. Kelly, F. C. *J. infect. Dis.* 1944, **74**, 93.
3. Krueger, A. P. *Nav. med. Bull., Wash.* 1942, **40**, 622.

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and mechanical washing of table-ware, the utensils, after removal of food remnants, should first be cleansed at a temperature of 120° F, using an adequate amount of a good detergent; they should then be rinsed for 2–5 minutes in clean water at a temperature of 170° F, allowed to drain and dry without wiping, and stacked, preferably under cover, away from dust and flies. For drinking glasses in bars, after washing in water at 120° F with a detergent, chemical disinfection with chlorine (50–100 parts per million) may be used, followed by rinsing in cold tap water. Such operations should be within the competence of reasonably intelligent, properly instructed, and decently paid staff working with up-to-date equipment and in surroundings pleasant enough to encourage them to maintain the sanitary standards which common decency and the public health demand.

Annotations

THE GOVERNMENT AND MEDICAL EDUCATION

Sir John Anderson, as Chancellor of the Exchequer, has recognised that universities will have to spend far more money after the war, and that a large share of the increase will have to be borne by the taxpayer. The parliamentary report on p. 255 shows that he has accepted the recommendations of the University Grants Committee for the coming two years. Especially notable is the fact that in each of these years the Government will provide £1,000,000 for developments in the medical schools arising out of the Goodenough report, and £500,000 for the teaching hospitals as the Goodenough Committee recommended. "Medical schools and teaching hospitals," remarks the *New Statesman*, "are clearly to be the favourite child of higher education." We must all be grateful to those who have stated so effectively the case for treating them generously.

ANÆSTHESIA IN THE PACIFIC WAR ZONE

GIVING an anæsthetic on the European front within easy supply range of England is one thing. On the Pacific front it is quite another. The distances make the supply of any but the most compact and simple equipment impossible, while the climate largely prohibits the homely "open ether." In any event, neither a jungle battle nor a naval landing is the place for elaborate apparatus needing skilled supervision and a series of cylinders. Ferguson[1] recounts how in his experience with the United States Navy in the early part of the Pacific war skilled anæsthetists were rare, and the anæsthetic chosen had to be one which the surgeon could supervise or give himself to a robust young adult in whom shock was not a prominent factor, and one which was suitable for treating wounds, reducing and immobilising fractures (mostly compound), removing foreign bodies, and performing other operations in a tropical area. Spinal, local, and block anæsthesia, and intravenous 'Pentothal sodium' best fulfilled these requirements.

He regards local anæsthesia as suitable for all patients, not excluding the excitable and apprehensive, provided complete anæsthesia is produced. In only one out of 218 cases of acute trauma did local anæsthesia need to be supplemented with a general anæsthetic. Brachial plexus block was used whenever possible for operations on the upper limb, and Ferguson speaks of it with enthusiasm. This view is in line with a recent revival of interest in England in this procedure.[2] In contrast to general opinion in this country Ferguson used spinal anæsthesia widely for battle casualties, and found it of great value in the difficult circumstances in which the surgical work was done. Severe shock was, however, rare in the casualties in this type of fighting, and when necessary the men were transfused before operation until the hæmoglobin was over 50%. General anæsthesia was used in only 8·5% of 1142 operations, local anæsthesia being preferred by both surgeons and patients. Pentothal in 3·3% solution was the general anæsthetic most used, but it adds to the danger of operations on the tongue and jaw. The danger of respiratory obstruction ever present with an œdematous relaxed tongue and pharynx makes local anæsthesia preferable for these operations. In Ferguson's opinion nitrous oxide and oxygen was the best anæsthetic for incision and drainage of gas-gangrene, but refrigeration was preferred for amputations in this condition. Ice in the necessary quantities was apparently available.

The inhibition of the bacteriostatic action of the sulphonamides by procaine is now well known, and further confirmation of this has recently been published.[3] But Ferguson's clinical impression was that the sulphonamides seemed to be equally effective in wounds whether they were operated on under procaine local anæsthesia or not.

1. Ferguson, L. K. *Nav. med. Bull., Wash.* 1944, **43**, 697.
2. Macintosh, R. R., Mushin, W. W. Local Anæsthesia: Brachial Plexus, Oxford, 1944.

SIGNIFICANCE OF TRANSIENT HYPERTENSION

THE mass medical examinations of men for the Forces have brought to the fore two questions relating to hypertension—what is the upper limit of normality, and what is the significance of transient rises in blood-pressure? The Americans have been assiduous in their efforts to supply the answers. Levy and his collaborators,[4] with the medical records of 22,741 officers of the American army at their disposal, have studied the relation of transient hypertension to persistent hypertension in later life; 38% of their subjects had been under observation for 15–19 years, while 6% had records covering 20 years or more. Their definition of hypertension was a systolic reading of over 150 mm. or a diastolic one of over 90 mm. Hg. Where subsequent readings were below these levels the case was labelled "transient." Transient hypertension was found in all age-groups, its frequency rising with age from 5·9% at 25–29 years to 18·6% at 50–54. At all ages sustained hypertension developed more often in those who had previously shown transient hypertension than in those who had not. The disability-retirement rate with cardiovascular-renal diseases and the death-rate from this group of diseases were also higher in those who had shown transient hypertension. Master[5] examined 50 naval men over the age of 40 years, 1–7 years after a single blood-pressure reading on the borderline of normality had been observed. On re-examination 38 of the series had definite hypertension, the readings often being much higher than the original one. In another US naval report, Rogers and Palmer[6] provide essentially similar data, though they present it rather more optimistically. Of 1574 naval recruits seen in one month, 14% had hypertension at the initial examination, a figure comparable to the 10% obtained by Palmer[7] in 3600 American college men. The majority of the naval recruits with hypertension were in their twenties, and half of them gave a family history of degenerative vascular disease. Rogers and Palmer report a follow-up study of 25 civilians with transient hypertension for periods up to 25 years. The one patient followed for 25 years has developed established hypertension but is symptomatically well at the age of 48; one may have had a posterior coronary infarct from which he recovered; the others,

3. *Anæsthesiology*, 1944, **5**, 605.
4. Levy, R. L., Hillman, C. C., Stroud, W. D., White, P. D. *J. Amer. med. Ass.* 1944, **126**, 829.
5. Master, A. M. *Bull. NY Acad. Med.* 1943, **19**, 704.
6. Rogers, W. F., Palmer, R. S. *New Engl. J. Med.* 1944, **230**, 39.
7. Palmer, R. S. *J. Amer. med. Ass.* 1930, **94**, 694.

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with the exception of one with pulmonary tuberculosis and one with a psychosis, are alive and well, and half of them have normal blood-pressures. A review of 211 patients with "mild" essential hypertension and 237 with "late" essential hypertension showed that in both groups there was a family history of degenerative vascular disease in three-quarters of the cases. Most of them fell within the fifth and sixth decades. In the "mild" group the mortality at a given moment of follow-up was 6%, practically always over the age of 50; the comparable mortality of the "late" group was 36%, and three-quarters of them died over the age of 50.

The common occurrence of transient hypertension in young men who seem quite well is further brought out by Graham's findings reported in this issue. On account of active service conditions these figures cannot be as comprehensive as those reported from America, but the fact that out of the 33 soldiers noted to have hypertension after a period of hard fighting in North Africa there were 28 whose pressure had returned to within normal limits when they were examined again after 2 months' rest behind the lines suggests that transient hypertension is a common effect of protracted fighting. What deductions can be drawn from these findings? The requirements of the Armed Forces in war-time are relatively simple. A single diastolic reading of over 100 mm. Hg automatically excludes the candidate from active service. Borderline cases may be accepted provided a full examination reveals no evidence of cardiac or renal involvement. The justification for this attitude is that, even though these cases of transient hypertension will probably develop sustained hypertension in the long run, this will not occur until after the age of 40, when a man is of little use for fighting. As a long-term policy this is short-sighted, but any other attitude would seriously jeopardise the manpower of the nation. There seems little doubt that these people with transient hypertension are the established hypertensives of middle age. Provided there is no family history of degenerative vascular disease there is a chance of their evading this fate, but if the family history is tarnished, then the ultimate prognosis—i.e., after the age of 50—is poor. While the pace of modern life continues, prophylaxis does not hold out much promise.

INSPECTION OF FOSTER-HOMES

"The child and the foster-home should each be studied so as to be able to match one with the other. It is not merely finding a foster-home, but finding the right foster-home for this child which will mean success. . . . It is skilled work to make the necessary adjustments between child and foster-home. . . . Specially selected and trained staff is necessary for the task of matching the child to the home, and for the supervision which should follow."—Pamphlet on "*The Care of Children brought up away from their own Homes*," published by the Provisional National Council for Mental Health.

"Almost every case of neglect should be detected either by the health or education services. . . . The first essential of any scheme is that there should be some person on the central staff of the health authority to whom all cases may be reported, who is available for advice, and who can devote a portion of his time to the administration and supervision of the scheme."

Dr. A. E. MARTIN, *Public Administration*, 1944.

WHEN large numbers of children must live away from their own homes, as has happened in this war, there will always be some discouraging examples of neglect and cruelty, either wilful or merely stupid. In generous indignation at these failures the public is apt to overlook the overwhelming proportion of cases in which children are well and kindly cared for. But this does not mitigate the distress suffered by the unlucky ones or lighten public responsibility for preventing repeated failures of the kind. Cruelty turns on forces in human nature which in the home are normally curbed by the parental instinct. Where this strong check is lacking the child needs some other safeguard. Examples of neglect amounting to cruelty can be found in resident homes and nurseries no less than in foster-homes, just as examples of first-class and imaginative child nurture can be found in all these places. We have always held that the best substitute for a child's own home is a good foster-home. But before children are placed in such homes, and after they are there, the homes and the foster-parents must be properly studied by people trained for the job: and the advice of these trained workers must be taken.

In a case now sub judice children had been under the care of a county-borough council since May, 1940, having been removed from their own parents on the ground that they needed care and attention. In July of last year they were sent to live on a farm. Full details of the methods of inspection of the foster-home in this case have not yet been published, but it is reported that on Dec. 20, 1944, a clerk employed by the responsible education committee visited the foster-home after notifying the foster-parents of her visit. She stayed for about an hour and a quarter, but did not visit the children's sleeping quarters. She recommended to her committee that the children should be removed from the foster-home. On Jan. 9 one of the children died and the foster-parents have been accused of manslaughter.

Such allegations are disquieting, and if established in a court of law the lesson they teach will be unforgettable. Authorities entrusted with the care of children have a serious responsibility; if they fail to fulfil it the children bear the brunt of their neglect. Foster-homes are a good solution only if they are properly supervised; and even a bad parent is better than a bad foster-parent.

DRINKING SEA-WATER

IT has been agreed for centuries that thirsty men in lifeboats must not drink sea-water, yet there have been suggestions in both world wars that sea-water could be drunk or taken by rectum with benefit. These suggestions had to receive serious consideration because they were made by scientific men and based on experimental work, and the exact scientific reply was not immediately to hand. Further work[1,2] carried out on both sides of the Atlantic has made the position clearer. Stated in its simplest terms it amounts to this. Sea-water may be regarded as a 3·5% solution of salts. The principal cation is sodium and the principal anion chloride. Magnesium and sulphate are also present in smaller amounts, but these ions are not in themselves toxic when ingested. The human kidney can excrete a urine containing about 2% of sodium chloride but no more, and consequently one of two things must happen when a thirsty person drinks sea-water. He may retain some of the salt. This must be to his disadvantage, for if he is desperate for lack of water his body fluids will already be hypertonic. He may excrete all the salt. Unfortunately he can only do so by drawing on his precious store of body water, and this can obviously do him no good. Interest has now shifted to the actual cause of death when dehydrated persons give way to the temptation to drink sea-water.[3] The work has been done on dogs, and it seems that in the later stages of dehydration the organism does not excrete all the salt in the ingested sea-water. The salt is retained in the extracellular fluids and raises their osmotic pressure so that water passes out of the cells. This leads to an artificial maintenance of the volume of the blood and other extracellular fluids and to a corresponding dehydration of the cells. Hence the animals die with disturbances of the nervous system and respiratory failure while the circulation is maintained to the end.

1. Foy, H., Altmann, A., Kondi, A. (1922) *S. Afr. med. J.* 1942, 16, 113. Elkington, J. R., Taffel, M. *J. clin. Invest.* 1942, 21, 787.
2. McCance, R. A., Young, W. F. *J. Physiol.* 1944, 102, 415.
3. Elkinton, J. R., Winkler, A. W. *War Med.* 1944, 6, 241.

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Much of the work done on dehydration in the last few years has merely confirmed principles which were well established in the past. Thus we have known since the time of Ambard and Papin [4] that there is an upper limit to the osmotic pressures found in the urine, and that consequently the fewer the solids to be excreted by the kidney the smaller the volume of urine a dehydrated person will have to pass. This method of saving water has been brought out again and again,[5] and it is clear that a minimum intake of salt and a diet consisting largely of carbohydrate and fat is the best for lifeboat personnel.[6]

TOXICITY OF DDT

THE remarkable new insecticide, DDT, is toxic to mammals as well as to insects. Its toxic action is cumulative and it can be absorbed through the skin. Smith and Stohlman [7] find that in cats, rabbits, and rats the symptoms of DDT poisoning strongly resemble those of poisoning by phenol, except that the action of DDT is delayed up to several hours and may persist for several days. It causes hyperexcitability and generalised fine or coarse tremors, which end in flaccid or spastic paralysis, with occasional tonic or clonic convulsions preceding death by respiratory paralysis. Examination of the blood by Smith's method [8] failed to reveal significant amounts of either free or conjugated phenols. Smith and Stohlman have evolved a method for estimating DDT in the tissues by means of the five atoms of chlorine which its molecule contains, assuming that the DDT is present in the tissues unchanged. They macerate and dehydrate the tissues with sodium sulphate, and after extraction with acetone determine the chlorine in the extracts. Modifications are necessary for the estimation of DDT in bile, fæces, and urine. This method gave good results when tested by adding DDT to animal tissues, 80–90% of the DDT added being accounted for. When a rabbit weighing 1·8 kg. was given 0·55 g. per kg. of DDT in olive oil by mouth and killed 2 days later, the DDT contents of tissues per 100 g. or 100 c.cm. were: blood 10·7 mg., liver 8·3 mg. kidney 3·9 mg., brain and spinal cord 16 mg., bile 80·0 mg., and urine 16·8 mg. These figures may be 10–20% too low, but they show how the DDT is distributed in the body.

In rats given 1–5% solution of DDT in olive oil into the stomach the LD50 was 150 mg. per kg.; in rabbits it was 300 mg. per kg. Death may be delayed for several days. Woodward and others [9] give rather higher figures for acute toxicity, ranging from 150 to 750 mg. per kg. for rats, mice, guineapigs, rabbits, and chicks. There were some survivals at the highest doses, probably owing to non-absorption. These workers found that DDT dispersed in gum-acacia was decidedly less toxic than in oil solution. The cumulative effects of repeated small doses were studied both by Smith and by Woodward and his colleagues. In both investigations it was found that 0·05% by weight of DDT in the diet was injurious and that 0·1% usually caused death within a few months. Ellis, Westfall, and Ellis [10] have lately demonstrated that DDT is more toxic to goldfish and frogs than to animals. When given food pellets containing DDT dissolved in olive oil, goldfish first became irritable, and then developed muscular incoördination and spasms, and prostration—a picture resembling poisoning by phenol or picrotoxin. The onset of symptoms was sometimes delayed for 4 days or more, and a single fatal dose took anything from 1 to 6½ days to kill the goldfish. The lethal dose ranged from 60 to 200 mg. per kg. body-weight. Frogs given injections of DDT into the dorsal lymph sac were killed in 4–72 hours by single doses of 150 mg. per kg., some dying after as little as 10 mg. per kg.

When applied to the skin in a dry form, DDT causes no toxic symptoms, according to Draize and others.[11] Even 4 g. per kg. of undiluted drug had no effect on rabbit's skin applied externally. In solution, however, it can be gradually absorbed through the skin to give toxic effects. The toxicity was not acute; doses of up to 2·75 g. per kg. dissolved in dimethyl phthalate and other solvents were not fatal. But daily inunctions of 0·5 c.cm. of 30% DDT in dimethyl phthalate caused death to rats, rabbits, and guineapigs after about 30 applications. Higher rates (4 c.cm.) killed these animals after 5–10 applications, though dogs survived such doses for very long periods. Local symptoms were rare, but applications which were eventually fatal usually gave general symptoms (anorexia or tremors) after the first dose.

In spite of the pronounced neurological symptoms produced by DDT poisoning (e.g., tremors, spasticity, terminal extensor rigidity), Lillie and Smith [12] report relatively slight histological changes in the central nervous system. In cats, rabbits, and rats these consisted in vacuolation round the large nerve-cells in the cord and cerebral motor nuclei. In the liver there was a hyaline centrolobular and midzonal degeneration similar to that described in poisoning by azobenzene and some of its derivatives, with a variable amount of coagulation necrosis.

The general impression left by the accounts of these investigations is that DDT is quite a serious poison to small vertebrates. But its toxicity is limited by its poor powers of penetration, and it can only exert its effects when dissolved in oil or various organic solvents. Thus, the statement by Smith that DDT is two or three times as toxic as phenol should be qualified. DDT is so toxic to insects that only dilute dispersions need usually be employed in the field; so the danger to man and other vertebrates is remote. The main hazard seems to be to operators who have to handle concentrated solutions.

FEATHERS FOR THE NEST

ON St. Valentine's Day Sir William Jowitt, supported by Mr. Attlee, Sir Archibald Sinclair, Mr. R. A. Butler, and Mr. Ernest Brown, presented a Bill to "provide for the payment by the Minister of National Insurance from the Exchequer of an allowance for each family at the rate of 5*s.* for each child except for the first or only child." The allowance will be continued, provided the child is still at school or an apprentice, till he is sixteen years of age. Though either parent may draw the allowance, it is, according to the Bill, legally to belong to the father. In practice, however, the mother will usually spend the money; and since she has to do the job we still think it would be more sensible to give the tools into her own hands.

The Government Actuary estimates that there are over 2½ million families with two or more children, and that the scheme will cost about £57 million during the first year. Children for whom orphans' pensions are paid are excluded, and adjustments in the allowance may be made where supplementary allowances or grants "under provisions relating to the Services, war injury, policemen, and firemen" are already being paid. Such exceptions, and the decision to make the cash allowance 5*s.* instead of the 8*s.* recommended by Sir William Beveridge, will naturally cause some disappointment; but the great thing is to have called the allowances into existence. It will probably be easier to increase them and widen their scope than it has been to achieve them.

4. Ambard, L., Papin, E. *Arch. int. Physiol.* 1909, **8**, 432.
5. Gamble, J. L. *Proc. Amer. phil. Soc.* 1944, **88**, 151.
6. See Editorial, *Lancet*, 1944, ii. 601.
7. Smith, M. I., Stohlman, E. F. *Publ. Hlth Rep., Wash.* 1944, **59**, 984.
8. Smith, M. I. *Ibid.* 1933, **48**, 1487.
9. Woodward, G., Nelson, A. A., Calvery, H. O. *J. Pharmacol.* 1944, **82**, 152.
10. Ellis, M. M., Westfall, B. A., Ellis, M. D. *Science*, 1944, **100**, 477.
11. Draize, J. H., Nelson, A. A., Calvery, H. O. *J. Pharmacol.* 1944, **82**, 159.
12. Lillie, R. D., Smith, M. I. *Publ. Hlth Rep., Wash.* 1944, **59**, 979.

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COURAGE

LORD MORAN'S *Anatomy of Courage*[1] is an essay on the nature of courage in fighting men, illustrated by a diary which he kept as a battalion medical officer in the war of 1914–18. Those who shared his experience will relive the familiar scenes here described with artistry and insight. He brings back that torn countryside of death, with its muddy trenches gashing the soil, the slippery steps into dark damp dug-outs, lit by the guttering candle so often snuffed by the blast of shell-fire. The reader almost feels anew the pitiless rain and the searching winds of the rolling country of the Somme; the familiar smells of Maple Copse and Delville Wood steal once more into another war-time air. A nostalgia for departed youth will descend, not unpleasantly, on many an ageing man who thirty years ago was living the hard and selfless existence of a battalion "MO." Lord Moran does more than paint the sombre battle country; he gives us glimpses of villages behind the lines, of those wonderful periods of leisure, of deep sleep between sheets, of old people and children gathering at the cottage doors to smile wistfully at the departing men when the end of rest inevitably came and singing soldiers took their way back to their calvary beyond the golden corn. He gives us brilliant portraits. And like a thread of silver running through the narrative the medical reader can trace and appreciate the anxiety of the doctor for his men, can sense something of the service given to them, and something, too, of the pain with which he sometimes had to harden his heart and send them back to their duties.

In the analysis of courage some perhaps may feel that Lord Moran has a less certain touch. Often he shows an almost uncanny understanding of the discontents of fighting men and their sources; yet elsewhere there seems to be a sudden failure of appreciation of a soldier's inner thoughts and fears. Describing the battle dreams of nearly all fighting men, he rightly insists that "we cannot cleanse our thoughts of fear by repression of the doubts and hesitations which 'occupy and mock the minds of men' in war." Thus and in many other vivid phrases he shows his remarkable insight into the war disorders of the mind. But many will question his view of death in the field as "a fine free setting forth . . . which comes to a man in the spring time, before age and disease have soiled his body and the traffic of cities stained his soul." Such a view is not likely to appeal to a young soldier; indeed it is probable that he would have a word for it in lively disagreement. "Whom the gods love die young" is surely a resigned and tame negation of all that a doctor should stand for. On another page Lord Moran portrays a good soldier shaken into a stupor by a near miss, and concludes: "When this sort of thing happens to a good fellow it is final." This again seems unjustifiably hopeless in a therapeutic sense. In this war the sergeant would retire to a Corps exhaustion centre little further away than the transport lines of the old war, and would have a very good chance of returning to his work in a fortnight. Instead of which, in the old war, "he must be hurried away to a shell shock hospital with a rabble of *misshapen creatures from the towns.*" This was an extract from the diary, and it may well be that it does not express Lord Moran's present views. It is not always the townsmen who break in war. Indeed, it is certain that neurosis and delinquency are highest in units in which intelligence is lowest. Such units are to be found among countrymen, especially when composed of men drawn from rural areas in which inter-marriage, bad housing, and mental deficiency are indigenous. Surely the Cockney soldier is of historic stout heart, and what of the Clyde-side battalions from Glasgow?

"Courage," writes Lord Moran, "is a moral quality." Later he writes, "Courage is will power." These two statements are bound to have great weight coming from such a source. There is obviously much truth in both; yet we cannot help reflecting that Lord Moran writes too exclusively of courage as seen in war. The idea that courage is will-power is one that has been strongly stressed by the psychological department of the German High Command, which is much interested in the readiness of the soldier to apply his will to military acts. But courage is a living function of a man's mind, and can be found in all sorts of situations apart from those of war. Thus there is the courage of the conscientious objector, of childbirth, of the conference chamber, of the cat burglar playing with discovery and sudden death as his stakes. And there is an amazing courage to be seen even on the scaffold. It is true that will-power must enter into many of these examples, but the derivation of all of them from moral qualities is more questionable. Such conceptions as these merit our careful attention, and discussion is likely to be exhaustive among readers of the *Anatomy of Courage*.

As for the future, Lord Moran points out that "when an army is being trained to fight it must begin by weeding out those whose character or temperament makes them incapable of fighting." This is the very kernel of military mental hygiene. He insists that this is not possible as a result of a brief interview by recruiting boards; a careful process of combined testing and observation is what is necessary during the early days of training. This is a matter for scientific medical and psychological investigation, which is already established in the Services and is producing clear results. For the future holds a desperate need for high intelligence, to be used wherever it can be found. It is all too scarce, as Lord Moran hints. The mechanisation of war means that heavy demands are made on the more intelligent for the manufacture, maintenance, and care of a legion of mechanical contrivances, which inevitably means that an ever smaller proportion of man-power is available for the actual fighting, whether on land, at sea, or in the air. Yet the less intelligent can be used if properly placed. That will be the task of selection procedures.

The book ends with a chapter on leadership; and the reader is left with an urgent sense of having to read the whole again. It expresses the author's pride in his country's fighting men, his devotion to the soldier in his trials and triumphs, and his bitterness for him when folly and the pursuit of ease have deprived him of the right equipment and the right leaders. In reading its burning and burnished English, we are tempted to modify a sentence of Christopher Morley's: "Every soldier has his own private crown of thorns; but what matters is whether he can wear it over his ear." That ability the British soldier has possessed for centuries; but one day he will ask who places the crown on his brow every time he must march to war.

1. The Anatomy of Courage. By Lord Moran, MC, FRCP. Constable. Pp. 216. 8s.

HOSPITAL FOOD

A leading article and three special articles on this subject appeared in our columns last month. A number of readers have asked us to supply copies for distribution to hospital committees and others interested. Accordingly we have reprinted the articles as a small booklet which is obtainable from THE LANCET Offices, 7, Adam Street, Adelphi, London, WC2, price 6*d*. (postage 1*d*.).

A BRITISH COUNCIL FOR REHABILITATION has been formed, which aims, inter alia, at securing the active coöperation of commerce, industry, and professional bodies in the problem of resettlement. Mr. H. E. Griffiths is chairman of the executive committee, whose members include Mr. E. S. Evans, Dr. F. R. G. Heaf, Dr. Donald Norris, and Dr. F. S. Cooksey.

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Special Articles

THE WOUNDED IN THE LOW COUNTRIES AND GERMANY

FROM OUR SPECIAL CORRESPONDENT

(*Concluded from p.* 220)

A new type of hospital has come into existence during this war. This is the 200-bed general hospital, which combines the services and the amenities of a base hospital with great mobility, and takes up a position, in relation to the fighting, which is geographically much the same as that of the casualty-clearing station. Its function is, however, different from that of a CCS, for it is a holding hospital. The period for which cases can be held varies very much, according to the operational position of the troops in whose area it stands. And in a time of emergency it may act very much as a CCS.

A Mobile General Hospital

The hospital I visited was the first general hospital to be set up in France, on D-day plus 3, about a mile from the Normandy beaches and not very far from Bayeux. Its next move was to Falaise. Another of the operations in which it assisted was that of St. Hubert and St. Vith. In the early days of the campaign in France the daily turnover of admission and discharges was very high indeed.

The hospital had often had to make long jumps from one site to another, the longest to date being from Amiens to a town between Louvain and Hasselt. And the fact that a 200-bed general hospital exists which can make these rapid moves is in the present conditions of warfare a useful asset.

To make rapid moves possible the detail of packing and transport has had to be thought out to the last packing-case, and as it is essential that movement should be possible by night or by day, in darkness or light, the marking of each case has had to be so contrived that it can be identified by touch. This has been done quite satisfactorily by a system of raised markings, which one recognises easily, whereas incised markings proved difficult and unreliable. The amount of lorry transport required is about twice that used by a CCS, and the men who accompany the lorries and pack each of them are the men who as a rule handle the equipment in the wards, operating-theatres, stores, and other departments. The most difficult part of the packing and removal is that of the well-equipped laboratory, and this takes time. But if need be, enough of the hospital to enable it to undertake acute surgery can be ready to move in two hours, and it can open in two hours when the move is completed. After moving, the hospital can have 150 beds working in twelve hours.

EQUIPMENT AND STAFF

This hospital has sheets on the bed and full-scale medical comforts, and broadly speaking it functions like any other general hospital. Its medical staff includes a surgical specialist, and it can have as many surgical teams attached to it as may be required; during the campaign as many as seven teams have been attached at one time. There is also a dental officer with a laboratory for making dentures, and a specialist in mechanical work who has about twenty years' experience. There is a specialist in ophthalmology, and a technical assistant with a full range of lenses and frames who can fit almost any kind of spectacles within an hour. The pressure on both the dental and eye services is heavy and continuous. The hospital carries a staff of matron, assistant matron, and twenty sisters.

A feature of this hospital, as of other medical formations which I saw, is that it has in its establishment a force of three padres. They represent the Church of England, the United Board (Nonconformist), and the Roman Catholic Church. Everyone to whom I spoke had only the highest praise for the padres' work, and several people approached me to draw attention to the valuable services they perform both in action and in the wards. The padres seemed to be an integral part of the hospitals or other medical arrangements I visited, in the same way as the medical officers. And this is a change from what was my experience in the long-ago war of 1914–18. It is perhaps symptomatic of a still bigger change in the Army organisation; for all services, all troops, all forces seem to pull together better and more understandingly than they did in that ancient period.

Besides the surgical, dental, and specialist ophthalmologist, the hospital also carried a medical specialist, a radiologist, and an expert in anæsthetics. Anæsthesia is, I was told, largely induced by 'Pentothal.'

The pioneering work of this hospital was done in England before D-day, by the present commanding officer. That is, the pioneering work of its organisation. To arrive at the detail of a war establishment and to cover every detail of transport and packing was the work of this very hard-working enthusiast. Without danger to the war effort it may be revealed that before the war he was a general practitioner; though he also knew the importance of being a soldier for purposes of military medicine, and much of his training was got in a field ambulance.

A department of the organisation in which rigid economy had been exercised was that of administration, represented by a quartermaster, a company officer, and the commanding officer himself. And that was the whole staff. At the time of my visit the CO seemed to be carrying out most of the administrative duties himself, owing to the absence of others on leave. But it is an understood thing in the hospital that any officer may be called on, in emergency, to discharge any function. Much of the success of this particular organisation must be put down to the drive and initiative of its commander.

RELATIONS WITH CIVILIANS

Among other things, the hospital has the happiest and most cordial relations with the people of the little Belgian town where it was situated at the time of my visit. The children of the schools collected—and in these days it is a matter of very great difficulty to do so—no less than 500 fresh eggs for *les blessés*. The townspeople, I was told, were almost embarrassing in their generosity. Someone would suddenly arrive, deposit a present of fruit (Belgium is rich in apples) or something else, utter the words *Pour les blessés*, and disappear without leaving name or address.

The particular town in which the hospital was standing was in an agricultural area, where eggs and other goods can be obtained, as is not the case in most parts of the country. Belgium as a whole is suffering severely from shortages, and food of all kinds is very scarce.

The hospital reciprocated the kind actions and generous feelings of the townspeople by arranging a Christmas party and giving presents to children and to patients. But the CO had a real problem with the givers of presents to the hospital, and solved it by printing a card from "The Officer Commanding, Officers, and Men of the Military Hospital, X" thanking all for their gifts and inscribed with the name of each person to whom it was addressed. Among both British and Belgians there will be pleasant memories of the hospital's stay in this little town.

Comparisons with 1940

The base medical arrangements of the British Liberation Army in 1945 show interesting differences compared with those of the first armies in France during 1939 and 1940. When I visited GHQ at Arras in May, 1940, and toured the then static front along the hypothetical

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Maginot Line—a few concrete positions and a lot of anti-tank ditches, slit trenches, and barbed wire—I found that there was a definite hangover as regards organisation from the war of 1914–18. The conception of mobile warfare was, as it were, diagrammatically represented on maps; but the physical possibility of mobile warfare, in the sense of masses of transport, armoured fighting vehicles, and fighter and bomber planes, was more potential than actual. And when I saw field ambulances and casualty-clearing stations installed with heavy equipment in permanent buildings I was moved to ask: "And how do you move?" I received a reasoned reply to my inquiry, although in some cases in May, 1940, it had begun to seem hypothetical that any move would occur. But the fact remained that field ambulance and CCS were still operating with very heavy loads of medical and Ordnance equipment, and the transport to carry it was not readily available. There was also the immense medical base at Dieppe, with stores, hospitals, and more stores, and more hospitals. The Germans who captured it later could give a better description of it than I, because they got there before I did; and indeed I never saw it. Unfortunately Hitler had conceived the idea of visiting Holland, Belgium, and France with his armies just at that time. These armies were highly mobile and there was no deficiency of either fighter or bomber planes.

The spirit of our armies was excellent at this pre-Dunkirk period; the medical organisation was very good too, but overweighted by past experience and past war establishments. Already we had at that period a blood-transfusion service with its headquarters in England, where it still remains. Already there were being worked out plans for "defence in depth" and the mobile warfare which that means. But the medical services had still to get the training of the desert and other campaigns, and the other forces and services of the Army had still to catch up with the organisation and equipment already developed in the German armies. What is notable now is that while the medical services have had to cut down weight carried in their mobile formations—field ambulance and CCS for example—and have acquired transport to make them fully mobile, they have not had to change fundamentally.

The medical service has developed the paratroop field ambulance which is specially equipped for its odd method of arriving at the scene of action. But the function of the "para" field ambulance is essentially the same as that of any other field ambulance, adapted to the conditions which may necessitate surgical cases being held for days beyond front-line positions. The light field ambulance has been developed to meet the needs of armoured formations, but it is still a field ambulance. And so it is with all the branches of the medical service. The use of surgical teams in advanced surgical units has arisen out of the conditions of mobile warfare. The use of penicillin, is the gift of Providence, neither foreseen nor hoped for, and this has led to one of the most important changes of treatment during the war. The advance in neurosurgery and faciomaxillary surgery are logical developments of last-war experience and of clinical developments in the inter-war period.

CHANGED BASES

Big changes have been brought about in base hospital arrangements by two factors: (i) the decision, taken before the war as a result of far-sighted strategy, to create an Emergency Medical Service out of the voluntary and publicly controlled civilian hospital and medical civilian services of Great Britain; and (ii) the development of our air power and the increasing use of air transport. The base of the operations of the medical services of the BLA since D-day has no longer been in France or Belgium but in Great Britain. This has saved the use of an immense amount of shipping space in carrying stores and equipment of all kinds to the Continent.

The base hospitals for the BLA now existing in France and Belgium, and soon possibly to exist in Holland and Germany, are advanced base hospitals with advanced supply depots.

This development would have been impossible but for our increasing predominance in the air and the increasing availability of air transport for medical services. Almost a third of all casualties are now evacuated by air from the BLA to Great Britain, and the proportion is likely to rise. This line of evacuation by air to Great Britain will become still more important as the line of communication lengthens into Europe. And the longer the line of evacuation the greater will be the proportional saving in the transport of medical stores and equipment. It looks as if the big changes already brought about by air evacuation of wounded in the BLA field of action may have important lessons for the war in the Far East, where distances are even greater.

Advanced Base Hospitals

The large general base hospitals which I saw in the towns of Belgium and France were singularly lucky in the buildings in which they were situated. One building had been erected for a hospital by the Belgians before the war, and was complete but had not been opened by them when the Germans arrived. The Germans opened it and when we occupied the town later we took over from the Germans. It is a tall building, spacious, well lighted, and well equipped. Running from the floor up to the top story is a continuous curving ramp which takes the place of stairs, and up which you could drive a small car. In this hospital first-class neurosurgery, faciomaxillary surgery, and chest surgery are being done, as well as other work of a great surgical centre.

Another building taken over was also occupied by the Germans, and they had left there a large number of their own wounded in very bad condition. The Germans are not using penicillin, and they give blood by direct transfusion instead of our own more highly developed and superior method. So septic were some of the cases that a German nursing sister who volunteered to give blood to a gravely wounded soldier—the operation being carried out by the German personnel—developed acute septicæmia in two days. She was saved by British treatment. The large quantity of instruments, dressings, and apparatus the Germans left behind them, as well as the orderlies, nurses, and doctors (some apparently with only three years' training) throw an interesting sidelight on the qualities and deficiencies of the German army medical service.

Evacuation and Convalescence

The base hospitals in France and Belgium are admirably equipped, and capable of giving any kind of treatment required. They do not hold their patients as long as the EMS hospitals in Great Britain—although they have every facility for doing so—because they are part of the operational set-up. To these base hospitals the CCS and hospitals in forward areas clear their casualties, and for the reception of these casualties accommodation must always be available. But this group of base hospitals, distributed over a wide area, acts as a cushion to take the pressure from the front-line areas. And this group of base hospitals is linked up by lines of air and sea evacuation with Great Britain. The necessary air-field and ports are there, and can if necessary be greatly extended. The transport planes are there, and also the hospital carriers and hospital ships. I saw an ambulance train go out from a base in Belgium to the coast, and it was well equipped except that it had supports for stretchers instead of bunks. It had food, medical attention, nurses, and orderlies on board, and it had the certainty of arriving at its port of disembarka-

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tion and of sending its wounded on by carrier to arrive in Great Britain in scheduled time.

Excellent as air evacuation is, it is more liable to interruption than evacuation by sea—most often by reason of bad visibility at one or other end of the journey. The ambulance train I saw off on its journey to Great Britain took a collection of men who had been waiting for air transport for two days.

Many patients who recover quickly from wounds or illness do not need to be evacuated to Great Britain. For these men and women there are good convalescent arrangements. If some of the people who object to the ATS going overseas could see the arrangements made for their medical care—and for their recreation and short leave—in France and Belgium, they might take a different view of the subject. The French and the Belgians—and our own troops are largely in contact with the Belgians—are exceedingly friendly. In France and Belgium we are in very friendly territory indeed.

If an ATS is ill near Brussels with some minor trouble, such as a bad cold, there is first-class accommodation where she can stay and recuperate for a few days in pleasant surroundings. I saw two of these places where girls were kept for a few days; they were cheerful and warm and the girls were very well looked after. I also saw two convalescent homes—one for men officers and one for women officers—in beautiful country near Brussels; my only criticism is that the conditions were so comfortable as to tempt the patient to try to prolong his stay. And while I was in Brussels I learned that a large convalescent home for ATS other ranks was being opened under similar conditions in a large building, well equipped in all ways and having in addition an excellent gymnasium.

The two convalescent homes I saw—and at one of which I lunched very well—were being run by the British Red Cross and St. John Organisation and there was a pleasant homelike atmosphere about them. The ATS other ranks' convalescent home is in the same district as the other two—a lovely country district amid woods which will be beautiful in spring and summer.

Achievements of the Medical Services

The Army medical organisation in 1940 had already reached a high standard, and the health of the troops was very good. Developments since then, in all branches of the work of an army, have thrown a tremendous strain on the officers and men, but the standard remains high.

To compare conditions in 1945 with conditions in 1915 is to realise what great advances have been made in simple hygiene, and what great changes these advances have made in the sickness-rate and the level of health.

There is still mud in Flanders, and there is much on the borders of Belgium, Holland, and Germany. But the mud does not pervade the soldiers' lives as it did in 1915. The soldier moves more from place to place; he has more use of transport, and is better supplied. Also the mobile bath units in the fighting areas enable him to keep clean to a degree undreamed-of in that earlier war.

Louse infestation and scabies on the scale common in 1915 are unknown. They are now rarities, not commonplace. And with them have gone a mass of skin infections. The soldier of today knows a great deal about how to keep himself well; he has an idea of "positive health," of keeping fit, which is higher, much higher, than in 1915.

The preventive services of the Army have protected him against tetanus so that, if not unknown, it is now a rare disease. In 1914–15 there was often no tetanus antitoxin available for acute cases, and there were many acute cases; in 1945 the universal immunisation with tetanus toxoid has prevented the tetanus occurring at all.

Epidemics—typhoid, cerebrospinal fever, and so on—just do not exist, and the ordinary sick-rate from illness is not a high one, because general health conditions are good. The preventive and hygiene services of the Army have done a magnificent job.

SURGERY

The treatment of surgical casualties has been revolutionised by (i) the rapidity with which first-aid is brought to the wounded and their speedy removal from the field, (ii) the bringing of surgical specialist assistance to the wounded in advanced positions and shortly after the time of wounding, (iii) transfusion with blood and other fluids soon after wounding, and (iv) the use of penicillin and other modern chemotherapy. This surgical work is done in very advanced positions when necessary; but for a large number of casualties such early advanced surgery is not necessary. Many cases are, of course, "walking wounded" and with appropriate treatment are able to resume duty quickly.

For severe surgical cases there is every requisite facility for further treatment in the advanced base hospitals, as I have called them—that is the large general hospitals of the BLA in France and Belgium. There is, so far as I know, no kind of case which cannot be dealt with in the general hospitals if the condition of the wounded man demands it. But for operational reasons it is clearly better to send cases needing prolonged and continuous treatment back to the United Kingdom.

The proof of the pudding is in the eating, and the proof of the efficiency of the medical services of the Army is in the very high recovery-rate of all casualties, medical and surgical.

FINAL IMPRESSION

From the fighting line to the great modern hospitals at the base of the BLA, the medical services work as one integrated coördinated and smoothly moving organisation. They have first-class medical, surgical, and other specialists, and eminent consultants whose work during the war has added largely to their experience. They have also a team of medical officers with units, with field ambulances, with CCS's, and with other hospitals, who have learned their work in years of war. They have experienced staffs of sisters and of trained hospital personnel. And with the combatant units and field ambulances there are MO's and other ranks, many of whom are veterans of several campaigns during the war.

The medical services have at all the places I visited the happiest relations with other branches of Army administration. Their importance in ensuring the fitness of the soldier is better understood by the non-medical services than it has been hitherto. This integration of fighting forces and ancillary services together in the BLA, this understanding and appreciation of each other's problems, this mutual confidence one in the other, is much greater than it was in 1914–18. Medical services and fighting forces are in this war, it seems, raised to a higher level of efficiency. The cause for which we are fighting is better understood than the cause we were fighting for then. And because of these things the morale of the Army is very high. The men I saw on my visit to front-line positions in Belgium and Holland and Germany were "on their toes" for the fight in which they are engaged.

MORE PHARMACISTS.—At the end of last year there were 25,285 persons on the register of the Pharmaceutical Society of Great Britain, compared with 25,224 the year before. The total includes 4471 known to be serving with HM Forces. Since 1900 the number of pharmacists has increased by 10,000, and it is now 1 per 1800 of the population. The percentage of women pharmacists is 10·5, and last year 52% of the entrants were women.

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SCIENCE IN PEACE

AT a conference held last weekend in London by the Association of Scientific Workers Prof. J. D. BERNAL, FRS, said that the standard of life in this country in the next few years would largely depend on how adequately and intelligently science is employed in industry. "In the past industry has too often been regarded as a means of producing cheap goods in large quantities irrespective of the uses and quality of the goods and of the lives of the workers who produce them. The modern aim for industry is to satisfy the needs of the consumers—that is, of the whole people—and at the same time provide them in their working hours, no less than their leisure, with the possibilities of worthwhile and interesting lives." This required the deliberate thinking out of industrial techniques and the application of science to them at every step.

Mr. HAROLD ROSE held that the outstanding social and political problem of the day was housing. Millions of homes would be required within the next few years, and the building industry must be reorganised and modernised to produce them efficiently and economically, utilising the large potential capacity of the engineering and aircraft factories. Traditional building methods must be supplemented so as to take every advantage offered by prefabrication. "Prefabricated" did not mean "temporary." Prefabrication was nothing more than the application of factory methods to building construction, so that the greater part of the normal site operations was carried out in the factory. At least six tons of water was used in the construction of a normal brick house, all of which had to dry out before habitation; prefabrication implied dry assembly, so that houses could be occupied immediately. Complete plumbing systems and kitchen fitments could be factory-assembled, and the whole connected up in the house in a matter of hours. Mass production, through standardisation, would reduce costs and make possible a high standard of quality and design. "If we seriously set our minds on getting millions of houses by non-traditional methods," said Mr. Rose, "they can be produced."

Speaking on health, food, and agriculture, Mr. F. LE GROS CLARK suggested that one of the first measures taken after the war should be to revert to first dietetic principles and get back to protein. It was in protein, and especially protein of animal origin, that the world's population showed the most obvious deficiency; and this deficiency had become serious during the war. It would take some time to raise the proportion of animal protein in the diet of about half the human race. But it was possible to expand the cultivation of the soya bean and other leguminous crops, and to produce strains with a higher protein content, while the extraction of protein from green leaves and the use of yeast should also be investigated. Secondly it was necessary to develop the breeding of good dairy cows, adapted to the purposes of every type of community, climate, and fodder. And thirdly, the potential harvest of the seas and inland waters must be explored: in many parts of the world the food resources of the fishing areas were relatively unknown and no measures had been taken to increase them and make them available. "We have become aware of the nature of protein deficiency in the course of the war," said Mr. Clark: "we have turned this island into a small experimental field for the raising of our available protein supplies. What we have apparently forgotten is that our trivial war-time deficiency or near deficiency is small in comparison with the protracted protein deficiency of half the human race. What we have to do is to turn from the pioneer or experimental stage to the large-scale application of method to every part of the habitable globe; and that will require a great team of biochemists and agronomists." A beginning should, he thought, be made with an intensive study of the technology and economics of food distribution and transport, and of the type of administrative machinery required to relate production more and more closely to human needs. Special attention should be paid to the stage between production and consumption—i.e., transport, storage, and distribution. "It is here that we are most ignorant, and it is here that we are likely to realise the largest reductions in the final price."

Dr. HORACE JOULES maintained that though enormous scientific advances have been made in medicine during the past 40 years, the people have failed to benefit from these advances owing to the lack of development of the medical services in this country. "Private interests should not be permitted to prevent the full development of a National Health Service, and we ask that medicine be removed from the market-place."

REMUNERATION OF PRACTITIONERS

PURSUING their plan outlined last summer (*Lancet*, 1944, ii, 223), the Minister of Health and the Secretary of State for Scotland have appointed a committee to recommend "what ought to be the range of total professional income of a registered medical practitioner in any publicly organised service of general medical practice . . . with due regard to what have been the normal financial expectations of general medical practice in the past and to the desirability of maintaining in the future the proper social and economic status of general medical practice and its power to attract a suitable type of recruit to the profession." The members of the committee are:

Sir Will Spens (chairman), master of Corpus Christi College, Cambridge; Dr. J. A. Brown, Birmingham; Dr. O. C. Carter, Bournemouth; Mr. E. Davies; Sir Ernest Fass; Dr. W. M. Knox, Glasgow; Mr. T. Lister; Mr. J. L. Smyth; Dr. S. A. Winstanley, Urmston.

Sir Ernest Fass is a former public trustee, Mr. Lister an accountant, Mr. Davies a solicitor, and Mr. Smyth secretary of the social insurance department of the Trades Union Congress. The medical members, who are all general practitioners, were nominated by the British Medical Association. Mr. H. F. Summers, of the Ministry of Health, and Miss A. V. Kelynack, MD, assistant secretary of the British Medical Association, will act as joint secretaries to the committee which may be addressed at the Ministry of Health, Whitehall, London, SW1.

WAR INJURIES COLLECTION

AFTER the destruction by enemy action in 1941 of the Army Medical War Collection housed in the museum of the Royal College of Surgeons, the Medical Research Council accepted a request from the War Office and the Royal College of Surgeons of England that they should assist with arrangements for forming a comprehensive National Collection of pathological specimens, photographs, and drawings of war injuries, which would serve both for teaching purposes and as a permanent record of the types of injury sustained in the present conflict. A special subcommittee of the Council's War Wounds Committee was appointed to direct the scheme; this subcommittee includes nominees of the three Fighting Services, the Ministry of Health, the Department of Health for Scotland, the Royal College of Physicians of London, the Royal College of Surgeons of England, and the Ministry of Pensions. The arrangements for the collection were entrusted to Dr. Joan Ross, who is acting as temporary curator.

A large number of specimens has now been accumulated, and by permission of the Royal Society of Medicine an exhibition of a selection of these is to be held in the society's council room at 1, Wimpole Street, London, W1, from Monday, March 5, till Friday, March 9, from 9 AM until 6 PM, both days inclusive. It will be open to all members of the medical profession, but not to the general public.

The exhibition will consist mainly of specimens, photographs, and drawings of wounds sustained in the land fighting in Italy and north-west Europe, which have been collected with the coöperation of the Army Medical Department. It will include museum specimens collected by Dr. Ross; coloured photographs by Mr. P. G. Hennell (by courtesy of the Metal Box Co., Ltd.); and drawings by Mrs. M. L. Wright and Mrs. Ehrenborg. It is hoped that all medical men or women having specimens of relevant interest to offer to the National Collection will communicate with Dr. Ross, Science Block, Mill Hill School, NW7 (Mill Hill 3640). It is intended that after the war the specimens collected shall be distributed to appropriate museums and teaching institutions.

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In England Now

A Running Commentary by Peripatetic Correspondents

To the social historian of today I commend the advertising columns of the *Times*. Here he will find a reliable mirror of the habits and customs of our people—the monetary value they attach to their goods and chattels, the names they give their children, their mourning habits, the vagaries of charitable appeals. A striking feature of the *Public Appointments* column these days is the demand for hospital dietitians. Unless there has been a sudden rise in their occupational mortality our hospitals have taken very much to heart the strictures being passed on their catering habits. There is a curious variety in the titles of these posts. In one recent issue there were three such advertisements; one hospital wanted a "dietitian," another a "food supervisor and dietitian," and the third a "lady kitchen superintendent." A few days earlier a Lancashire hospital had been advertising for a "food supervisor," and that sounds to me the best name. Having spent part of my school-days in the Palatinate, I have always retained an affection for this hard-headed, plain-speaking county where spades are spades. What other title would fit the official responsible for preparing menus of hot-pot, tripe, pig's trotters, and eccles cakes, varied occasionally with fried fish and chips, not to mention that most delectable of cheeses that even in the days of peace was well-nigh unobtainable in London? No lady kitchen superintendent could produce that dream of a hungry man, a Lancashire hot-pot; not the miserable apology that passes for such in the south, but the real thing that stars at hot-pot suppers. And "dietitian" suggests illness, calories, vitamins, and the rest of the scientific or pseudoscientific jargon of this new science of nutrition. We are at last realising that our patients' well-being depends as much on the taste, serving, and variety of their food as on its scientific analysis.

* * *

I was rather surprised and pleased, when my WAC (I) staff-sergeant handed me an invitation to her sister's wedding, for our opportunities of seeing Indian domestic life are limited, and a uniform acts as a kind of negative passport. The invitation itself was a notable document, not only containing time and place but also placating the curious by giving the occupations of the bridegroom and the bride's parents. The reception was held in a small room, with rows of chairs like a classroom or political meeting, and on a sofa opposite the door the bride and bridegroom, heavily garlanded and prepared to face all comers. I committed the solecism of shaking hands with the bride as well as the bridegroom, which is apparently not done, though it is pardonable in an ignorant foreigner. After our entry we sat down, and just went on sitting down for half an hour, while later arrivals came in, and a gramophone played what I am told was wedding-music. This was a trying time, as readers of Beverley Nichols's remarks on Indian music will realise. I was then asked if I would "take a little lunch," the time then being 7 PM Indian standard time, and we went into a small room where a table was laid for twenty people. "Laid" is perhaps an exaggeration, for there were only brass plates, on a scale of one per guest, each plate containing some highly spiced nuts, a sickly-sweet doughy ball, not further identified, and a banana, bursting at the seams. The nuts were very hot, and I longed for some *pani*, but all I got was a cup of very sweet coffee. After we had plied our fingers sufficiently, a cloth was passed round with which to wipe them, and I suffered by being low down on the rota. I asked my VCO, who was next me, what happened next, and to my dismay he replied "seats are now resumed." I dreaded a further session of gramophone music, but to my relief we passed the door leading back to the reception-room and went out by another door, where we fell into the hands of what I can only describe as an assembly-line of ushers, modified for India. My first intimation that anything was amiss came when the first usher poured scent over my hair, which is not used to such treatment. The second man decanted a brown fluid, said to be sandal-wood emulsion, over the back of my right hand, using a small ladle. The third dabbed a few minims of attar of roses on the same place; the fourth handed me a small bouquet "to take away"; and the fifth gave me a cocoa-nut. Then we were released. Later on, as I attempted with indifferent success to remove scent from hands and hair, I decided that I was glad to have seen an Indian wedding, that I was grateful for my hosts' kindness, but that in future I would take the advice of Virgil—*Ex uno disce omnes*.

* * *

Last week I saw a charming lad of 20, but he was an enuretic. He had seen dozens of doctors since early childhood and some of his phrases came out so pat that he was obviously telling an oft-told tale. He had been a stammerer as a boy, but had got over that. Two points in his story struck me: one was that he was a very deep sleeper and an alarm-clock even by his head was no use; the other was that when he was living alone in a shack, doing his own cooking, bedmaking, and laundry—i.e., going to bed without fear of enuresis and its unpleasant consequences—he had six months' freedom from it, whereas now it occurs twice a week. He was in his public school fifteen, but was a day-boy. I wish I could have helped him more than I did, as he seemed to have all the healthy instincts.

The last case before this which I encountered was over a year ago, a child of 10 who was sent to see me alone. After considerable denial on his part and persuasion on mine (2 Mars bars) he did admit that he was sometimes aware that he was passing water in bed. Then I got a lovely spontaneous sentence from him—"It feels like sliding down hill"—obviously, my dear Watson, the pleasure bribe to the infant to empty his bladder being translated into the swinging-riding sensations so attractive to childhood. I had heard he had marine aspirations, this boy, so I painted him a rather glowing picture of sea life—God forgive me—in which he and the Captain played decisive parts, an alluring picture in which wet beds were unthinkable, since when save for one night in an air-raid he has been dry. But we see so few cases that we are apt to fall into the *ab uno disce omnes* heresy. That's the worst of being a GP.

How much more fortunate is my colleague who is chairman of a medical board! He says he has seen dozens lately. A recruit will sail through his examination, but when he comes up to the chairman and is asked if he has anything to say, out comes his "No, I am very fit, but since I was a boy . . .; and there are mother, sisters, aunts, all waiting in the wings, ready to confirm and console. Really, I do not see why this disability which does not impair a man's fighting capacity should rob him of the privilege of serving his country. One might have enuretic regiments or even a division. They would be very successful in damp climates—the rainy season in Burma—or in night operations.

* * *

Cycling, they tell me, strengthens the muscles, ventilates the lungs, tones up the myocardium, and exercises the kidneys. I have even seen it said that it prevents piles, cures fistula-in-ano, and is one form of prophylaxis against that dread nightmare, an enlarged prostate. And yet I don't like it. Being a hospital non-resident, and having laid up the car for the duration, I thought I should maintain and prolong a fast-vanishing youth by adopting this (?) praiseworthy mode of travel. In summer-time it is endurable. Then one can enjoy the salutary effect of halcyon skies and balmy breezes; one can arrive home stimulated by the sunshine, and positively revel in the increased body-content of vitamin D. But the summer is short. Now with an envelope of snow, a floor of ice which negatives each of Newton's three laws, and winds direct from the polar regions, it is definitely not worth while. One advantage however this cycling has given me—a closer association with my fellow employees of the hospital. Cycling à deux renders our common antagonist—whether it be wind, rain, snow, or merely gravity—much less formidable. And one gets to know some points of view other than one's own, or those of one's own immediate sphere. The nurse, the technician, the masseuse, and the porter all have opinions on the modus operandi of the hospital of which the consultant, secure in his little shell, has no inkling. For the democratic doctor perhaps this broadening of the mind compensates for the rigours of winter? No; I cannot convince myself of that, but I do believe that when it's all over I shall look back on my cycling career with pleasant memories.

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Parliament

LARGER GRANTS TO MEDICAL SCHOOLS

If the universities are to play their proper part after the war, they will have to spend much more than before the war, and Sir JOHN ANDERSON, Chancellor of the Exchequer, in a statement on their financial needs said it was clear that a large share of this new expenditure must be met by the Exchequer. The Government, he said, recognised that as this expenditure would not be spread equally over the next 10 years, their grant to universities during the later years of the decade would need to be substantially increased above the level proposed for the next two years.

The University Grants Committee have recommended that the present annual vote for the universities of £2,149,000 should be increased for each of the next two financial years by the addition of £2 million for general university purposes, by £1 million for developments in the medical schools arising out of the recommendations of the Interdepartmental Committee on Medical Schools, and by £500,000 for grants for teaching hospitals as recommended by that committee, The Government have accepted these recommendations. The Goodenough Committee also estimated that an additional £10 million (at pre-war prices) will be required for capital develòpments in the medical schools, and the Government recognise that a substantial proportion of the money will have to be provided from the Exchequer. In view of the restrictions on building, it seems unlikely that the universities will have opportunities for any considerable capital expenditure during the next year or two, and Sir John Anderson thought it would be sufficient to include in the Estimates for the coming year a token sum of £250,000 for distribution by the University Grants Committee, without prejudice to what may be necessary in later years. Accordingly, he was including in the 1945 Estimates £5,900,000 as a grant in aid of universities, colleges, medical schools, and teaching hospitals in Great Britain.

Dr. EDITH SUMMERSKILL asked what period of grace the Chancellor proposed to give, medical schools which now admit only men, to make arrangements for the admission of women before he withheld their grants. But Sir J. Anderson was glad to say that question had not so far come within his jurisdiction.

FROM THE PRESS GALLERY

Supplies in Liberated Europe

In the House of Commons Mr. RICHARD LAW, Minister of State, said that lack of transport created almost insoluble economic difficulties in particular regions and there was inevitably very great hardship. But that did not mean that there was a serious overall shortage of food, or that the problem would be solved, or even eased, merely by pumping quantities of foodstuffs into ports already strained to capacity. France was producing as much foodstuffs as she did during the enemy occupation, and great quantities of food formerly taken by the German army were now available to the French people. The principal difficulty in France was distribution and, in the main, transport. In Belgium local production, together with SHAEF's imports, which were rapidly being increased as the produce of last harvest became exhausted, would be sufficient with proper distribution to attain the present target of 2000 calories per head per day which had been set. But in the view of the British Government the collection and distribution of foodstuffs in Belgium had not been satisfactorily organised. In the liberated areas of Holland difficulties had been increased by the continuance of military operations. Increased supplies however were coming in, and the situation was rapidly improving. But the most formidable problem would arise only when the enemy-occupied areas had been liberated.

The criticism that UNRRA had responsibilities for supplying France, say, or Belgium which it had been unable to discharge was entirely unjust. UNRRA could not intervene in any country unless it was invited by the government concerned. Both in France and Belgium the governments had preferred to take on this responsibility for themselves, in so far as it had not been, of necessity, a military responsibility. That did not mean that other governments—who were unable to finance the relief of their civil populations—would not wish to hand over this responsibility to UNRRA, or that UNRRA would not have work to do that would tax its capacity to the utmost.

For the past two years the Anglo-American authorities had been working out concrete and increasingly effective plans, the essence of which was that there should be a military period, when the areas liberated would still be in the immediate war zone, and a civilian period when fighting had ceased, or at least had passed out of the area concerned. It was accepted that during the first period the import of civilian supplies could only be carried out successfully by the military authorities. The energies of the Allied armies in the field of supplies had been inevitably confined to first-aid. The long-term task of rehabilitating the national economy, and of distributing food in excess of the standard set for the military period, belonged to the civilian period. This was by no means confined to food-supplies: it involved re-starting the whole economic life of the countries concerned. It was at this point that the national governments themselves must begin to take over. The French Provisional Government and the Belgian Government had already formulated their import programmes for the first six months of this year, and the competent British and American authorities had been instructed to facilitate procurement against these programmes so that supplies would be ready for shipment as shipping became available. The Allied Governments had, of course, decided for themselves in these programmes what supplies were most essential. Preliminary steps towards the compilation of a Netherlands Government import programme had already been taken. The United States Government appreciated as fully as did the British Government the vital importance of provisioning the liberated Allied countries in the wake of the battle.

Internal transport was one of the main problems. Since D-day 7500 lorries had been sent to the SHAEF area (i.e. France, Belgium, and liberated Holland) for civil purposes. The reconditioning of ex-Army lorries was already under way. The present production was 100 a week and was expected to rise to 350 a week by the end of March. The ultimate target was 750 a week and it was hoped to provide more new lorries as well. They were concerting with the French authorities measures to speed up locomotive repairs in France; several hundred locomotives had been sent to the Continent for the use of SHAEF and a further 200 would be sent in the near future.

The requirements of the liberated areas were in direct competition with urgent military demands. But Mr. Law was confident that our European Allies understood that the British and the American Governments were doing everything in their power, and that they understood that the main objective (theirs as well as ours) must be to bring the war in Europe to an end at the earliest possible moment.

In reply to a question by Mr. H. NICOLSON, Mr. LAW defined the position in regard to appeals by private organisations and others for the relief of civilians in Allied countries. In all but exceptional cases money collected in this country would have to be spent in the purchase of goods in this country. Goods of the kind most commonly required were in short supply and facilities to buy them could as a rule be given only to the purchasing agencies of the Allied Governments or to UNRRA. In the case of goods or articles which an individual or a society was able to spare from among those in his or its possession, it was essential that the appropriate Government department should be consulted before any appeal was issued, since otherwise rationing and other regulations might unwittingly be infringed. Subject to this, however, collections of certain kinds of goods, such as spare garments, might serve a very useful purpose. Goods so collected would have to be placed at the disposal of an Allied Government or of UNRRA who would arrange with the military authorities for the transport. The approval of the Allied agency concerned should therefore be secured before any appeal was launched. The Government warmly sympathised with the motives which had inspired the wish expressed

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by several city and municipal authorities to adopt towns in liberated Europe, but they considered that the procedure was scarcely appropriate now and might well raise false hopes in the very different circumstances obtaining today.

Blighted Areas in Scotland

In the House of Commons on Feb. 14 Mr. T. JOHNSTON, Secretary of State for Scotland, moved the second reading of the Town and Country Planning (Scotland) Bill which like the English Act passed last year deals chiefly with blitzed and "blighted" areas. The blighted areas, Mr. Johnston said, were the main planning problem, for in Scotland there was appalling overcrowding. Many of the houses were totally unfit for human habitation, and many more fell deplorably short of modern standards, or were too small for family life. The overcrowding survey before the war showed that 34·5% of the houses in Greenock, 39·4% of the houses in Motherwell, and 39·7% of the houses in Clydebank were overcrowded. The 1941 census showed that in Coatbridge 23% of the houses had only one room, and about 50% had only two rooms. In parts of Glasgow and in some of the other industrial towns the density of population was as high as 127 houses, or more than 700 persons, per acre. The densities in the large English cities were only about half as high as that. Under the Bill the local planning authorities would be able to apply to the Secretary of State for orders authorising the compulsory purchase of land in these blighted areas, which required to be redeveloped as a whole, and of land to accommodate the overspill of their population and industry, and to replace their open spaces. The Bill did not provide for financial assistance to local planning authorities in the acquisition of land in the blighted areas.

Local Government Adjusted

On Feb. 15 the Commons discussed a motion by the MINISTER OF HEALTH approving the proposals of the recent white-paper on local government (*Lancet*, Jan. 13, pp. 57, 63). Mr. Willink said that the Government had three main objectives. Local government would stand or fall by those whom it could attract to its service and he hoped that a reasonable proportion of younger men and women would be chosen as members. In much of the work of local authorities women had more natural interest and often more expert knowledge than men. This was true of the health services, of housing, of maternity and child welfare, and, not least, of the care of children who had no normal home life. A high standard of local-government officers was no less important, and their recruitment, qualifications, training, and promotion were now being considered.

The second objective was to assure local authorities a greater measure of stability than at present so that they might make long-term plans. The third and pressing necessity was that Parliament should encourage vigorous and confident work throughout the local-authority field. How could authorities be expected to press on with urgent plans if they felt themselves to be in peril of extinction, and the negotiations now going on in connexion with the National Health Service necessarily assumed that the present main structure of local government would still be in existence when that service came into operation.

The proposal for a boundary commission appeared to have met with pretty general approval. Some change should perhaps be considered in the minimum limit of population for an application for county-borough status, which since 1926 had been 75,000. The general directions to the commission might also deal with the linking of town and country areas within an administrative county. It was proposed to appoint a special body to advise the Government on local-government problems in London. Fine as the work of the authorities within the county had been during the war, no-one, said Mr. Willink, was satisfied with the present lay-out of the metropolitan boroughs and the London County Council, and the Government desired to deal with these problems with all expedition.

Turning to finance he said that the block grant, which was based on the aggregate expenditure of all local authorities and was distributed among the authorities largely on the basis of their relative needs, was a form of supplementary income to local authorities, and the poorer the authority the greater was its share. Even before the war it was recognised that some revision of the formula was due. Also the recalculation of the total grant, which should have taken place in 1942, had not been made and the local authorities had suffered a substantial loss. The Government proposed to deal with both these problems as soon as possible, and there would be a bias in favour of the poorer authorities.

Social Insurance

In the House of Lords on Feb. 15 Lord NATHAN pressed for early legislation giving effect to the policies outlined in the white-papers on social insurance and industrial injury insurance which, he said, were not a programme but only a promise of one. The success of the social insurance scheme was dependent on the Government's ability to keep the cost of living stable after the war by the same methods as during the war; and the Minister of National Insurance should be required by statute to review the rates of benefit and the rates of contribution periodically in relation to ruling prices. It was essential that occupational disability should be the basis of assessing assistance and that there should be reconsideration of the retirement pensions. The need for speed was overriding, for the demobilised armies must not find this great reform still in the pigeon-holes after the last shot had been fired.

Replying for the Government Lord WOOLTON, Minister of Reconstruction, reminded their lordships that a Bill to provide family allowances has already been introduced in the House of Commons and he said the Government were going to introduce a Bill on the industrial injury insurance scheme. Other legislative proposals included the main insurance Bill, but it would be foolish to say when it would be ready, or when Parliamentary time would be available for its introduction. Now the Minister had been appointed however, they had been able to go ahead with the administration. From April 1 next the existing schemes of health insurance, pensions, and unemployment insurance, now administered by the Health Department and by the Ministry of Labour and National Service, would be administered by the Minister of National Insurance, Sir William Jowitt. Certain duties in connexion with workmen's compensation would be taken over by the new Ministry from the Home Office. The determination of old-age pension appeals would be taken over from the Health Department, and as from April 1 the Minister of National Insurance would become responsible to Parliament for the work of the Assistance Board. The Bill to deal with the break-up of the poor-law must come last, for it would not be right to deal with that until the main Bill dealing with the new rates of insurance had been settled. The transfer of all this work would involve the transfer of about 6000 people. On one issue, added Lord Woolton, he could not give any satisfaction whatever. The Government had quite definitely rejected the linking of benefits to subsistence rates. Frequent variations of benefits according to a cost-of-living standard was going to be difficult in what was primarily an insurance scheme. We wanted people to come back to this country, Lord Woolton concluded, to work here and to be happy here, to feel that they had some reasonable hope for their own development; and that, he held, was the principle of social stability—he would not use the expression social security.

QUESTION TIME

Paper for Educational Books

Sir E. GRAHAM-LITTLE asked the President of the Board of Trade whether he is aware of the dissatisfaction in university and scientific circles because the paper control exercises a censorship of publications through the allocation of the paper pool by a small committee whose activities are conducted without any opportunity of public criticism; and if he will widen the membership of this committee and state the principles upon which they are instructed to proceed.—Mr. E. DALTON: I am aware of the dissatisfaction in the universities and schools about the shortage of educational books. The small reserve of paper is set aside with the very object of relieving the shortage of these and other essential books. The committee which advises me on the distribution of this reserve consists of an independent chairman, Sir Walter Moberly, and four representative publishers, and it works on

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the broad principle of helping publishers to produce books of special importance, particularly educational books and reprints of the classics, for which they cannot find paper from their normal quotas. I am glad to say that I have recently been able to arrange for an increase in the allocation to the reserve and this should help further to relieve the shortage of educational books. I do not propose to make any alteration in these arrangements at the present time.

Day Nurseries

Mr. H. McNEIL asked the Minister of Health if he was aware that his decision to close day nurseries had caused deep disappointment to many working-class mothers and had evoked protests from a number of local authorities; that nursery schools were not a substitute for nurseries as their function was different; that the post-war housing situation would make these nurseries an essential social service; and was he prepared to receive representations on the subject.—Mr. H. WILLINK replied: The war-time nurseries have been provided at the cost of the Exchequer as an aid to war production. They have been provided as a war service under emergency powers and those powers cannot be used to provide a normal welfare service.

Rehabilitation for the Deaf

Mr. F. MESSER asked the Minister of Pensions if there were any rehabilitation centres in this country for the deaf and hard of hearing similar to those in the USA; whether there was any clinic, other than that at Manchester University, in which standardised tests were made of the capacity of ex-Service or civil deafened patients to benefit from different types of aids to hearing.—Sir WALTER WOMERSLEY replied: I am making inquiries as to the scope of the work done at the centres referred to. Standardised tests are conducted by aural specialists at each of my regional offices to determine the most suitable type of aid-to-hearing appliance for ex-Service and civil deafened pensioners. In addition to the one at Manchester University, there are also special clinics at certain of the London hospitals, which are consulted in cases of difficulty.

ACCOMMODATION FOR THE TUBERCULOUS.—Mr. WILLINK said that the latest returns show that local authorities in England and Wales have provided 29,000 beds for the tuberculous and that the number of patients waiting for institutional treatment is 4500.

On Active Service

AWARDS

CBE

Colonel N. C. SPEIGHT, FRCSE, NZMF

OBE

Colonel R. A. ANDERSON, MB DUBL., RAMC
Lieut.-Colonel J. A. BATY, FRCSE, RAMC
Lieut.-Colonel J. G. M. A. BRUNET, LMS NOVA SCOTIA, RAMC
Lieut.-Colonel A. D. DAVIDSON, MB ABERD., RAMC
Major A. E. JOWETT, FRCSE, RAMC
Colonel W. J. OFFICER, MB EDIN., RAMC
Lieut.-Colonel M. H. P. SAYERS, MB LOND., RAMC
Captain H. M. JAMISON, MB LOND., RAMC
Captain L. N. B. RAJA, IAMC
Captain KEVIN MCCAUL, LRCPI, RAMC

MC

Lieutenant K. C. STEPHENSON, RAMC
Lieut.-Colonel ALEXANDER BURNS, MB GLASG., RAMC
Captain J. W. R. BATTRAM, MRCS, RAMC
Captain DUNCAN MITCHELL, MB BELF., RAMC
Major V. S. SIDHU, IAMC
Captain K. C. GUPTA, MB, IAMC
Captain P. C. SARKAR, MB, IAMC
Captain B. G. KIDDLE, IAMC

MENTIONED IN DESPATCHES

Surgeon Lieutenant G. J. POTTS, MRCS, RNVR

COMMENDED

Surgeon Lieutenant E. J. GILMORE, RINVR

For good services in fire-fighting after an explosion at Bombay docks.

PATHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND.—A meeting will be held at St. Thomas's Hospital Medical School on Friday and Saturday, March 23 and 24.

Letters to the Editor

INTRAPERITONEAL CHEMOTHERAPY

SIR,—I hope your timely leading article of Feb. 10 will stimulate a greater use of intraperitoneal sulphonamides, for if suitable drugs are correctly employed many lives will be saved and much unnecessary suffering avoided. I would add a few personal points which may be of value, having employed and studied the method for five years and used it in upwards of 300 cases.

Application, although not standardised, is best done via a saline suspension warmed to body temperature; 4–10 ounces of saline is usually necessary according to the amount of drug used, and the suspension should be squirted into the abdomen as a fine jet from a Record syringe, without a needle or rubber tube. This will guard against clumping of the particles, which is liable to cause trouble as the drug tends to remain in situ and afterwards to be discharged as a lump or become walled off. Introduction via an indwelling catheter, for the same reason, is not wise because a large quantity tends to accumulate at one point.

Dosage should depend on the amount of contamination and pus present. Pus should always be sucked out or mopped away as carefully as possible before introducing the drug. I have used quantities as large as 25 grammes with no toxic effects in a large number of cases and have repeatedly used 15 g. The choice of drug still seems to depend on the individual surgeon; I personally use sulphapyridine and have been well satisfied with the results, but have had no opportunity as yet of employing penicillin owing to the shortage of supply. I would end by briefly describing a case recently under my care.

A young schoolmistress, with a history of 48 hours' abdominal pain and vomiting, exhibited extreme abdominal rigidity and tenderness and was very toxic. General peritonitis from a ruptured appendix was diagnosed and confirmed at laparotomy. A huge quantity of pus and debris was sucked out of the abdomen and a ruptured pelvic appendix removed; 20 g. sulphapyridine was squirted into the peritoneal cavity before closure and the abdomen drained by two stab holes, the paramedian incision being closed without drainage. She was up on the fifth postoperative day, was discharged from hospital on the tenth day, and travelled home to Scotland by rail, a journey of 400 miles, on the thirteenth day. There was little drainage beyond a slight discharge for 4–5 days and the wound healed by first intention. Her doctor has since written to tell me that she is very fit.

Aylesbury. R. H. GARDINER.

RADIO-FREQUENCY CURRENTS IN TUMOUR TREATMENT

SIR,—The suggestion made by two radio engineers, Mr. Forsythe and Mr. McCormick, in your issue of Feb. 10, and your constructive annotation, provided an excellent example of the close collaboration which should at all times exist between the medical and engineering professions. The proposal to employ "gettering" for inducing local heat at the site of an intestinal neoplasm is ingenious in principle; but, as you point out, a number of difficulties arise in its practical application. Even if it be assumed that a controlled rise of temperature of a metallic pellet, accurately placed, could cause the destruction or regression of a tumour without undue damage to adjacent tissues, there still remains another effect to be considered. The high-frequency electric field which would be required to induce currents in a metallic pellet, say, within the lumen of the gut, would necessarily irradiate the parts of the body interposed between the pellet and the coil used to generate the required field. The high values of field required to heat such a pellet at a range of 2–8 inches would probably cause considerable rises of temperature in intervening adipose tissue, muscles, &c.

The answer to the problem of how best to induce accurately controlled local heating in selected tissues or organs of the body, by means of radio-frequency currents, must surely lie in the proper choice of the frequency, field intensity, and method of irradiation. Here is a fruitful field for the combined resources of the physiologist, the engineer, and the clinician.

W. PROCTOR WILSON.

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MEASUREMENT OF VITAL CAPACITY

SIR,—Even from this distance I feel I must reply to the letter from Dr. D. R. Davies and his colleagues in your issue of Nov. 18 last. I am glad that independent observers have put my method to trial, and would like to make the following points in reply.

1. My own comparative observations with the spirometer were made on 51 students during their physiology course.
2. My method does *not* measure vital capacity, which by definition is the maximum expirable air.
3. How can the increase of heights of the four "cones" be "measured independently and show marked individual variations" when the sum of the increases is only 2 to 5 cm., as measured by "L"?
4. The probable error worked out from 30 consecutive measurements on each of 2 subjects was 8·7% (182 ml. approx.).
5. Vital capacity is the *maximum* expirable air, and my definition of lung expansion is the *maximum* volume increase of the chest. Therefore it is correct to take not the mean of successive readings, as in chemical estimations for example, but the *maximum* of a series of observations.
6. The error between two successive measurements with the spirometer made on students, who are at any rate used to handling apparatus, is often 400 ml., or about 10%.
7. Spirometers are not available in Army outpatients departments, and the errors in observations on personnel completely untrained in the use of apparatus, such as gardeners or apprentice bricklayers of 18½, are likely to be very great. But these men can take a deep breath.
8. The value of my method is that it is an easy clinical test; it has proved useful, and has an accuracy of 10%. But it is *not* claimed that it should replace a tried physiological measurement.
9. It is possible to take the figures away and calculate them at leisure.
10. It has been found that if spirometer readings are taken on physiology students on several successive days, an "improvement" of 1 litre in vital capacity can easily be obrained provement" of 1 litre in vital capacity can easily be obtained by "training." This surely must be due to increased skill in using the apparatus.
11. It is true that the calculations are sensitive to the measurement "L," but it is easy to make this measurement to 1 cm.; an error of half an inch is unnecessarily large. The difference in volume resulting from a difference in measurement of 1 cm. is in a small chest 200 ml., in an average chest 340 ml., and in a very big chest 610 ml., approximately, not between "500 and 1500 ml."

India Command. H. K. GOADBY.

FUNCTIONAL DISORDERS SINCE D-DAY

SIR,—Cases referred to a South Coast hospital by Army medical officers for specialists' opinions have shown new features since D-day. Though the number of cases I have seen in the last few months is not large, the proportion showing these features has been high.

In past years the cases seen have corresponded in distribution with other reported series. For example, of 77 seen in September–November, 1943, 22 were suffering from psychoneurotic disease, or psychosomatic disease with evident psychogenic element, 16 from dyspeptic conditions with smaller psychogenic element, and 14 from respiratory conditions. They were drawn, as cases still are, from units training in the area. In September–November, 1944, symptoms were not greatly different, but when histories were taken two main groups emerged:

1. Men who had served efficiently in anti-aircraft batteries for years, but had been transferred to infantry when AA defence on its former scale was no longer necessary.
2. Men who had been wounded, and after care in hospital, broke down on resuming training, with symptoms out of proportion, or not in physical relation, to the injury.

In group 1 the conditions for which the men were referred included effort syndrome, breathlessness on exertion, emphysema (slight), catarrh, and dyspepsia. The average age was 32, and it would be expected that men of that age, especially with histories of respiratory or digestive illness, would stand transfer badly.

Group 2 comprised 20 men wounded in France or the Low Countries who were referred under such headings as cardiac investigation, chest pain, effort syndrome, very doubtful hæmoptysis, scar adherent to pleura, blast (?), and mitral stenosis. In 9 the main complaint was dyspnœa on exertion, and in 6 persistent pain; 3 cases presented as dyspepsia (2 having radiological evidence of pathological appendices), and 1 had tremor and loss of weight. In the 18 radiologically normal cases physical examination was negative except for hyperæsthesia. Nervous disturbance was admitted by 6, but in history or on general clinical examination the remaining 12 showed no evidence of psychological lack of adjustment such as was plain, for example, in the 22 psychoneurotic cases seen in September–November, 1943. The average age was 27.

Until D-day it was agreed that the war neuroses common in 1914–18 were now uncommon. But the above figures seem to show that they are appearing again. If these men had not been wounded, their symptoms would probably have been more easily recognised as psychogenic. Their physical recovery preceded their emotional readiness for combat. What seems to be necessary is handling of the recently wounded with a view to preventing neurosis, restoration of physical capacity by thorough rehabilitation at an early stage, and grading of the training of units containing such men. They are probably not as fit as they appear.

Royal Sussex County Hospital. W. A. BOURNE.

PNEUMOCOCCAL LOBAR PNEUMONIA

SIR,—The paper by Dr. Dick in THE LANCET of Feb. 3, and his letter of Feb. 10 commenting on our paper of Jan. 20, raised matters of considerable importance in the use of sulphonamides in pneumonia. It seems to us that the views expressed in his article are open to serious criticism. Three-quarters of cases of pneumonia would recover without any sulphonamide whatever. We have no clear means of knowing before the final outcome whether or not any given case would be in the unfortunate quarter. All cases therefore must have chemotherapy. It is generally accepted that the more serious cases will only respond to an adequate concentration of the drug in blood and tissues. Dr. Dick disputes this view on what we consider to be very inadequate evidence. The division of 161 cases of pneumonia into two groups of 126 cases with a drug level under 6 mg. and 35 cases with a drug level over 6 mg. per 100 c.cm. is so disproportionate, statistically, that any comparison must be, to put it mildly, of little value. The analysis of the temperature reactions to the drug 96 hours and 144 hours after commencement of treatment is also unsatisfactory. A temperature response to sulphonamide (especially sulphapyridine) is generally obvious after 48 hours. Many cases of pneumonia are not admitted to hospital until the third or fourth day, and after the sixth day natural defervescence may occur at any time. The detailed analysis of 17 patients with a low drug level, all of whom recovered, is really unwise; 17 such recoveries would be by no means rare without sulphonamide treatment at all. The high incidence of complications (5 cases) may be of greater significance than the absence of deaths, but here again the figures are too small to warrant conclusions.

With so many variable factors deciding the outcome in any given patient, only large numbers and comparable cases can be used to assess the significance of a single factor such as the blood-concentration of the drug. A much sounder method is to observe the effect of raising the blood-level of the drug in a patient who is not doing well on the ordinary dosage and whose blood-level is low. This we have often done and we are quite convinced that in such cases to increase the dose of the drug, parenterally if necessary, can be a life-saving measure. Our experience is so convincing (to us) that we are prepared to blame inadequate doses of the drug as the major cause of death in certain patients.

So far as Dr. Dick's letter is concerned we should like to point out that we have never suggested that sulphamezathine is more efficacious than sulphapyridine. Experience with several hundreds of cases treated with sulphamezathine convinced us of its low toxicity, though toxic effects undoubtedly occur. We have seen moderate leucopenia in a few patients and dangerous leucopenia in one case after heavy and prolonged dosage. We have not

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observed the serious complication of crystal formation and renal involvement which may follow treatment with sulphadiazine. Our personal experience of the latter drug is small, but there is ample evidence from the literature that the risk of renal damage from both sulphadiazine and sulphapyridine is a real one. The efficient therapeutic dose of sulphamezathine is higher than that of sulphapyridine, and its action is not quite so dramatic; but in mortality and morbidity rates there is little to choose between the various drugs. Sulphamezathine has decidedly fewer side-effects and is both safer and more pleasant to take.

Our main reason for writing this letter, however, is to state categorically that Dr. Dick's views regarding the efficacy of a fixed dosage of *any* sulphonamide, irrespective of the clinical condition or evidence of effective absorption, are dangerous, and that we profoundly disagree with his conclusion.

W. A. RAMSAY.
Crumpsall Hospital, Manchester. R. W. LUXTON.

LOCALISATION OF FOREIGN BODIES

SIR,—In his extremely interesting article of Dec. 9, 1944, Dr. Brailsford complains of the number of unsuccessful operations for removal of foreign bodies. These unsuccessful operations are mainly due to error in judgment on the part of the surgeon, because, as Dr. Brailsford points out, a large number of foreign bodies are best left in situ.

Dr. Brailsford omits one important point concerning foreign-body localisation. Over five years' experience of Army radiology has taught me that the time factor is one of the most important. When a rush of patients comes, it is impossible to make accurate localisations in every case; therefore this procedure should be carried out only in difficult cases. A general hospital is often called on to work on a CCS basis, with a rapid turnover of patients, only retaining such patients as cannot be moved on. The result is that a rapid stream of patients passes through the X-ray department, followed by successive streams as convoys arrive.

My practice is to screen as many of these gunshot-wound cases as possible. This was essential in the Middle East in earlier days when films were scarce. If the foreign body or bodies are small and innocuous, no marks are made on the skin. If I consider that the surgeon may wish to know the site for possible operation, anterior (or posterior) and lateral (or medial) marks are made, depending on the position of the foreign body. If thought necessary, films may be taken; otherwise a drawing of the approximate size and shape of the foreign body is included in the X-ray report. These skin markings are usually a sufficient guide to the surgeon, and I must say I have not seen "many unsuccessful operations for removal."

During the screen examinations I decide which case requires accurate localisation. If any case is thought to be difficult from the surgeon's point of view, a depth measurement is given quite rapidly by the use of Scott's localiser, a simple method which records a scale on a film. This is fairly accurate. The Army supply all X-ray departments with the McGrigor localiser, which is an accurate method; I have, however, found that a simple scale method is speedier when speed is necessary. The number of cases requiring accurate depth measurement is relatively small.

Dr. Brailsford quotes your leading article of Oct. 28, 1944, which stated that "field surgical units have facilities to produce those rough plates which are all that the forward surgeon requires." What are "rough plates?" Perhaps they are the plates kept unwashed in the operating-theatre for three days or more. The surgeon who relies on "rough plates" will be asking for trouble.

Usually it is useless to give a depth measurement for abdominal foreign bodies, because they often move in position. Extraperitoneal foreign bodies deeply placed in the posterior abdomen are difficult and require very accurate localisation. The main radiological investigation for abdominal foreign bodies should be directed to demonstrating the presence or absence of gas in the abdominal cavity. This is best done by first taking a lateral view with the patient on his back, when air can be seen between the liver and the anterior abdominal wall. A view is then taken from the side with the patient, still lying, turned on his left side. This information is much more important to the surgeon than the supposed position of a potentially mobile foreign body. The investigation should not be considered complete without films of the chest and the pelvis.

Like Dr. Brailsford, I would like to stress the importance of coöperation between surgeon and radiologist. Many of the troubles of both can be avoided if they take the small trouble of consulting each other, especially concerning the more difficult cases.

JOHN A. ROSS.

BACTERIOLOGY OF RESTAURANT CUPS

SIR,—Much has been written about the dangers of infection arising from the cracks found in the cups in public cafés and restaurants, but little appears to have been done to discover what such dangers may be. I have now studied the bacteriology of about 20 cups obtained from various public restaurants. In general, no organism has been found which could be blamed for an outbreak of diphtheria or typhoid, but the findings suggest that if such organisms were to obtain a footing, then the particular article might be a danger. All the pottery used for the tests was carefully washed and then held in a stream of boiling water for 15 seconds. The article was then broken down the original crack and a culture made from the break. The cultures were made on blood-agar, McConkey's agar and glucose-broth. In all cases, cracks on the side of the cup from which the user would drink were used. In no case was a sterile result obtained. The findings were as follows:

Cup no.	*Culture from crack*	*Growth*
1	*Staph. aureus*	free
	Hæmolytic strep.	free
2	*Staph. aureus*	free
	Non-hæmolytic strep.	scant
	Hæmolytic strep.	scant
	Non-path. spore-bearer	moderate
3	*Staph. aureus*	free
	Non-hæmolytic strep.	free
4	Hæmolytic strep.	free
5	Hæmolytic strep.	free
6	Hæmolytic strep.	free
	Staph. aureus	scant
	B. proteus	scant
7	*Staph. aureus*	scant
	Hæmolytic strep.	scant
8	*Staph. aureus*	moderate
	Non-hæmolytic strep.	scant
9	*Staph. aureus*	moderate
	Bact. coli	scant
	Non-hæmolytic strep.	moderate
10	*Staph. aureus*	moderate
	Non-hæmolytic strep.	moderate
11	*Staph. aureus*	moderate
	Non-hæmolytic strep.	free
12	Non-hæmolytic strep.	free
	Bact. coli	scant
13	*Bact. coli*	scant
	Non-hæmolytic strep.	free
14	Non-hæmolytic strep.	free
15	*Staph. aureus*	free
	Non-hæmolytic strep.	free
	B. fæcalis alk.	scant
16	Hæmolytic strep.	moderate
	Staph. aureus	scant
17	Hæmolytic strep.	moderate
	Staph. aureus	scant
18	*Bact. coli*	free
	Staph. aureus	free
19	Friedlander's bac.	heavy
20	Hæmolytic strep.	moderate

What is surprising is the frequency of the hæmolytic streptococcus, which one would imagine would be easily destroyed. There was also a fairly frequent appearance of intestinal organisms (*Bact. coli*, *B. proteus*, &c.), and one cup gave a heavy growth of Friedlander's bacillus. The other common organism was the *Staph. aureus*. Nearly all the organisms found were such as are commonly associated with stomatitis, and with mouth and gum complaints generally.

A cracked cup, then, may be a source of danger when some infected person has previously used it. The presence of Friedlander's bacillus is also an indication that respiratory organisms may be a source of infection and it is a reasonable assumption that the Klebs-Loeffler bacillus may be found if the cups have been used by a carrier. The presence of hæmolytic streptococci is also a reminder that a cracked cup may be an agent in the spread of scarlet fever. Syphilitic infection is unlikely but not impossible, and in the same category falls tuberculosis. These organisms, particularly the former, would be difficult to discover from cracks, but the fact that even relatively easily killed organisms can be found alive in such sites suggests that their transmission is not impossible. The most obvious danger of cracked and chipped crockery is however that of ulcerative stomatitis.

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The usual excuse offered for the use of cracked cups is shortage of crockery, but if the public health is to be cared for such a consideration should have no weight, and legislation should be pressed to forbid the use of faulty vessels.

London, W1. SYDNEY LINFOOT.

INGUINAL HERNIA

SIR,—In Lieut.-Colonel Brandon's interesting article of Feb. 10 there is a remark at the end of phase 2 which reads "and one that may yet save the merchant seaman from becoming a sort of animated ironclad." There is no further indication as to what special operative procedure this refers.

I know that when I was a house-surgeon at the Dreadnought Seamen's Hospital at Greenwich 20 years ago a silver filigree was often used in the repair of herniæ, and is still so used. In the last 19 years at sea as a ship's surgeon I have seen many of these cases afterwards, frequently for some years, and in my small experience the operation has been quite successful.

It would be a pity if a pithy and telling phrase was allowed to discredit what has, in good hands, proved a very satisfactory procedure.

H. M. ROYDS JONES,
Surgeon, Orient Steam Navigation Co.

A CHAIR OF PSYCHIATRY

SIR,—The letter from "Service Psychiatrist" in your last issue has evidently been written without knowledge of the full facts.

The Goodenough Committee recommended that the London County Council's plans for the development of the teaching of psychiatry should be implemented "at the earliest possible moment." The filling of the vacant chair is the keynote of this development. There is nothing sacrosanct, however, about Sept. 1 as the date on which the successful applicant should take up the post. It was regarded, for the purpose of an estimate of the cost, as the earliest date by which the position could be filled.

The advertisement for applicants will be issued by the university. All the points raised in the letter about Service applicants have been well in mind. The university will be recommended to ensure that at least three months should be allowed between the issue of the advertisement and the receipt of applications. Advice will be taken from the Service departments as to whether three months is adequate. The directors-general of the Services will be asked to circulate information as to the vacancy through Service channels. There is no doubt that if a serving officer, who could not be released, were selected, there would be no difficulty in deferring the date of his taking up the appointment until he was free.

The sentence "Your announcement suggests that the LCC is prepared to pay him provided that the University of London accepts their nominee" seems to have been written in a complete misunderstanding of how these university appointments are filled. The university appointment is made by the senate on the recommendation of a university committee. The committee comprise a few LCC representatives, three expert assessors appointed by the university, together with the vice-chancellor (in the chair) and the principal of the university. Their nomination is submitted concurrently to the university and to the LCC.

J. W. BOWEN,
Chairman, Mental Hospitals Committee, London County Council.
County Hall, London, SE1.

SIR,—May I support the protest by Service Psychiatrist in your last issue? Three years as consultant to a Force overseas have impressed upon me the really vital importance of doing nothing at home that will distract or distress the thousands of Service doctors, many of the highest qualifications and skill, whose task for a long time to come will be that of healing and assuaging the sickness and wounds of our fighting men on the land, at sea, and in the air. Every sympathy is felt for those hospital and teaching bodies who have vacancies on their staffs which they are anxious to fill, and who are perhaps suffering from the makeshift arrangements rendered necessary by a long and arduous war; but it is urged most earnestly upon all bodies with medical appointments to fill that such appointments should remain vacant until the end of the war so that doctors who may have been overseas for years may share with those who have spent the war at home at any rate the right to compete for positions for which many of them are eminently suited.

If our Service doctors are to go to fresh adventures in the Far East looking anxiously over their shoulders at the doings of their brethren at home (who have already enjoyed many advantages in addition to their uninterrupted domestic felicity) the result will be a bitter cleavage in our profession which may take many years to heal.

G. W. B. JAMES,
Brigadier; late consultant in psychiatry to the Middle East Force.
London, SW1.

SIR,—Surely a decision to make any appointment depends not only on the prospect of suitable available candidates but also on the need for filling the vacancy? A decision to call for applicants scarcely need take account of the former issue. The importance which Service Psychiatrist seems to attach to this chair would seem to argue against its being left vacant until Japan is defeated. Further, there is still ample time for any overseas psychiatrist to apply for this post. Should one of these be appointed, I hope one may reasonably anticipate that the Army authorities would see fit to release him for such an important post, and thereby give one like myself the opportunity to "see the world" in his place.

CIVILIAN PSYCHIATRIST
(not aspiring to the chair).

ŒSTROGENS IN CANCER

SIR,—The Royal Society of Medicine has arranged for a scientific committee, composed of the following fellows of the society, to investigate the effects of œstrogens in cancer:

Chairman: Prof. E. C. Dodds.
Vice-chairman: Dr. Alexander Haddow.
Hon. secretary: Dr. Frank Ellis.
Sectional representatives:
Experimental medicine and therapeutics: Mr. A. L. Bacharach and Dr. K. M. A. Perry.
Obstetrics and gynæcology: Mr. Malcolm Donaldson and Mr. James Wyatt.
Pathology: Dr. W. E. Gye and Dr. R. W. Scarff.
Radiology: Dr. Ralston Paterson and Prof. B. W. Windeyer.
Surgery: Mr. Rupert Corbett.
Urology: Mr. F. McG. Loughnane and Mr. Clifford Morson.
Coöpted: Mr. G. F. Stebbing and Dr. A. B. Bratton.
Dr. K. M. Mather was coöpted as statistical adviser.

The advisability of forming such a committee was considered by the council of the society after a preliminary investigation by the radiological section at 15 radiotherapeutic centres of the effects of stilbœstrol in more than 100 cases of cancer of the breast (see *Proc. R. Soc. Med.* 1944, **37**, 731). At its first meeting the committee decided to concentrate attention on carcinoma of the prostate, breast, and œsophagus, to confine the investigation to diencestrol at two prescribed dosage levels, and to ask that records be kept on forms based on those of the National Radium Commission, approved for use in the Ministry of Health's scheme for cancer. It was further decided that to avoid statistical difficulties the decision regarding the dose of drug to be used should be by random selection.

This letter is written on behalf of the committee so as to provide an opportunity for members of hospital staffs who might wish to coöperate in this investigation to communicate with the undersigned.

Royal Society of Medicine, Wimpole Street, London, W1. F. ELLIS.

THE death is announced in New York of Dr. FRED H. ALBEE, consulting surgeon to the New York Hospital for Joint Diseases and a former president of the American Orthopedic Association. During the last war he used living bone grafts as internal splints, and the operations which bear his name make use of this technique. He was 68 years of age.

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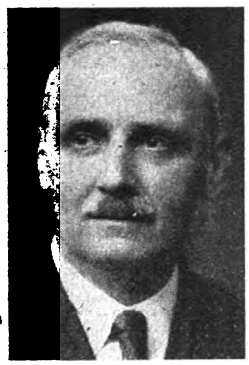
Obituary

WILLIAM THOMAS RITCHIE

QBE, MD, LLD EDIN., FRCPE, FRSE

Dr. Ritchie, who died at his home in Edinburgh on Feb. 7 at the age of 71, had retired in 1938 from the Edinburgh chair of medicine, in which he worthily maintained a great tradition. He was president of the Royal College of Physicians of Edinburgh from 1935 to 1937.



Swan Watson

Graduating in 1896 he spent some time in Vienna before returning to his own city. He served in the last war, first as medical officer with the 1st/3rd Scottish Horse, and later in charge of the medical division of the 27th General Hospital in Egypt, for which service he was mentioned in despatches and created OBE. On succeeding Dr. Lovell Gulland as professor in 1928 he devoted himself wholeheartedly to the promotion of teaching in the university and in the Royal Infirmary. At the beginning of his tenure of office, considerable changes were made in the curriculum of the clinical years, particularly the third year, so as to correlate the instruction in medicine, surgery, pathology, bacteriology, and pharmacology. When he came to the chair, the department of medicine consisted of little more than a lecture theatre and a professor, but he succeeded in securing premises and staff, and introduced demonstrations, lecture-demonstrations, and tutorials. He was constantly on the watch for material for his lectures and demonstrations; at no time did his lectures stagnate, and he made good use of his gift for freehand drawing, both on the blackboard and on paper. Besides being physician to the Royal Infirmary, he was physician and director of the medical unit of the Edinburgh municipal hospitals. Soon after the outbreak of this war, he returned to the Royal Infirmary to take temporary charge of the wards of a colleague who was on military service, and he was also physician to the Emergency Medical Hospital at Bangour.

Ritchie was the first to describe auricular flutter as a clinical condition, and in 1914 he published a monograph on it. He collaborated with Dr. John Cowan in the three editions of their *Diseases of the Heart*, and was joint author of *Medical Diagnosis, a Manual of Clinical Methods*. His many papers were mostly on his favourite subject of cardiology, and his public utterances included the Gibson lecture in Edinburgh in 1923, and the St. Cyres lecture in London in 1939.

He acted at various times as external examiner in medicine at St. Andrews, Durham, and Aberdeen. The reputation he acquired of being a hard examiner—a reputation of which he was well aware—did not come of any conscious intention; but he set himself a very high standard both of competence and honesty, and he expected the same from his students. To all his university and hospital work he brought a single-minded devotion which never flagged, and private practice was always made to take a place second to his primary duties as professor of medicine. When he retired from his chair, he did so with sorrow, and it was one of the greatest pleasures of his life that he was able to return to the charge of wards during the war. He took a keen interest in the careers of his juniors, being always approachable and willing to give his valuable advice. Though at times he was a difficult man to work with in committee, this was because of his desire to do what he felt to be best for his university and hospital. If he had a problem to tackle, he had to master it in finest detail; and having done so he pursued his chosen course with thoroughness.

His university last year conferred on him the honorary degree of LL D, and it gave him much satisfaction that at the same ceremony his elder son graduated as MB. His widow survives him with two sons and two daughters.

Notes and News

MEDICAL WAR RELIEF FUND

DURING the year 1943–44 the Medical War Relief Fund, under the chairmanship of Dr. H. Guy Dain, gave financial assistance to 35 applicants—9 more than in the previous year. Gifts amounted to £4700, and loans to £1200. The total number of beneficiaries—some of whom have received more than one award—is now 113. Substantial assistance has again been obtained for applicants from other benevolent funds, such as the Lord Mayor's National Air Raid Distress Fund, the Officers' Association, and especially the Royal Medical Benevolent Fund, and several applicants have received war service grants. For the first time since the inauguration of the Fund, distributions exceeded contributions. As in former years the Fund was well supported by doctors overseas—the total sum contributed through the Canadian Medical Association, for instance, now exceeds £2500. A subcommittee of the Fund provides medical books for British doctors who are prisoners-of-war, in coöperation with the Educational Books Section of the Red Cross and St. John organisation, which arranges their dispatch. This arrangement has two important advantages. First, the parcels sent bear the Red Cross label, which receives priority, so the books arrive sooner than they would if sent by a bookseller. Secondly, the EBS keeps a stock of medical books at Geneva and the time taken in transit is greatly shortened when a request from a prisoner-of-war can be met from this "Geneva reserve." During the year, 112 books were dispatched to 25 different camps and hospitals, the cost being £150. Only sums specially marked by subscribers are used for the purchase of books.

Examples of the cases helped by the Fund are as follows:

Dr. G had volunteered for the Forces in 1939, leaving a successful practice which, being situated in a much bombed London district, had seriously declined during his absence. His own house had been bombed, and, with a greatly decreased income, he had been obliged to find accommodation for his family in the country. He had not been able to keep up the payments of interest on a loan negotiated in connexion with the purchase of his practice, and considerable arrears had accumulated. The pressure exerted on him by the insurance company was causing him great anxiety, which was relieved by the award of a substantial gift from the Fund.

Dr. H, who had also practised in an area which was largely destroyed by bombing, died prematurely after most arduous work in the London blitz. His house was uninhabitable, and what remained of his practice was unsaleable. His widow required help, particularly for the education of her children. She was awarded a suitable gift to supplement a grant received, through the Medical War Relief Fund, from the Lord Mayor's National Air Raid Distress Fund.

Dr. I was killed while serving in the RAMC. His widow hoped to obtain remunerative employment but needed temporary assistance in meeting educational expenses. The necessary provision was made by the Fund in coöperation with the Officers Association.

Dr. K had relinquished his commission in the RAMC on medical grounds after serving for more than 3 years. His practice, which was largely private and included only a small number of insured patients, had suffered seriously during his absence, and it had been necessary to use all his capital to defray the family expenses. He was given assistance, partly in the form of a loan, to tide him over the difficult period of re-establishing himself in civilian practice.

Subscriptions should be sent to the hon. treasurer at BMA House, Tavistock Square, London, WC1.

REABLING THE DEAF

THE three American army centres for deafened soldiers, which were mentioned last week in a Parliamentary question, are established at Deshon Hospital, Butler, Pennsylvania, at Hoff Hospital, Santa Barbara, California, and at Bordon Hospital, Chickasha, Oklahoma. Many cases of deafness are discovered for the first time after the soldier has joined the Army and these men, together with those who have incurred their deafness during service, are referred to the centres. The hospitals keep a stock of deaf-aids, which are scientifically prescribed, and the soldier is able to find by experience exactly which suits him best. The fitted ear-pieces, to which the aid is attached, are now to be manufactured there from clear acrylic resins or lucite. Instruction is also given to the patients in lip-reading and speech correction.

A LIBRARIANS' JOURNAL

THE Association of Special Libraries and Information Bureaux has received a licence for the publication of the *Journal of Documentation*, and the first number of this new quarterly is to appear shortly under the editorship of Mr. Theodore Besterman. The journal will contain reviews of articles and books dealing with bibliography and librarianship and their related studies and techniques, of works of reference, especially those intended for library use, and of works dealing in a general way with the humanities and sciences. The address of the journal is 52, Bloomsbury Street, London, WC1.

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University of Cambridge

On Feb. 10 the following degrees were conferred:

MD.—R. I. N. Greaves.

MB, B Chir.—* C. D. Drew, * H. H. E. Batten, * D. W. R. Lyle, * I. A. Magnus, * T. J. S. Patterson, * A. N. Pearson.

* By proxy.

Medico-Legal Society

On Thursday, Feb. 22, at 5 PM, at 26, Portland Place, London, W1, Dr. Kenneth McFadyean will speak on the need for reform in statutes affecting illegitimacy.

Society of Public Analysts and other Analytical Chemists

At 3.15 PM, on Friday, March 9, at the Chemical Society's rooms, Burlington House, Piccadilly, London, W1, Mr. S. Ernest Melling, FRIC, will deliver his presidential address embodying observations on water and water-supplies.

Medical Superintendents Society

A meeting of the council will open at the Queen's (LMS) Hotel, Birmingham, on Saturday, March 3, at 10 AM.

Institute of Hospital Almoners

Sir William Beveridge, MP, will speak at the annual meeting of the institute which is being held at Caxton Hall, Westminster, on Friday, March 9, at 5.30 PM.

Medical Films

The following films will be shown by the Scientific Film Association at 1, Wimpole Street, London, W1, on Wednesday, Feb. 28, at 5.30 PM, and again at 8 PM: *Mass Radiography, The Larynx, Liver Fluke, Accident Service.* Tickets from the secretary of the medical committee, Dr. S. J. Reynolds, 14, Hopton Road, London, SW16.

Royal Sanitary Institute

At a meeting to be held at the public library, Cheshunt, on Friday, March 2, at 3 PM, Dr. Brian Russell will speak on post-war housing requirements.

The meeting, which was to have been held at Liverpool today, Feb. 24, has been postponed.

Refresher Course on Tuberculosis

The Joint Tuberculosis Council and the National Association for the Prevention of Tuberculosis, by arrangement with Manchester corporation, are holding a refresher course for tuberculosis officers and other doctors at Manchester University from Monday to Thursday, April 23 to 26. The lecturers will be Dr. D. P. Sutherland, Mr. A. Graham Bryce, Mr. J. B. Macalpine, Mr. V. F. Lambert, Dr. J. H. Harley Williams, Dr. H. G. Trayer, Dr. C. Metcalfe Brown, Dr. George Jessel, Dr. Peter Edwards, Prof. E. D. Telford, Dr. G. Lissant Cox, and Dr. Osborne Hughes. Further information from Dr. Harley Williams, Tavistock House North, Tavistock Square, London, WC1.

Royal Society of Medicine

On Monday, Feb. 26, at 4.30 PM, at the section of odontology, Mr. Rainsford Mowlem will read a paper on osteomyelitis of the mandible; Mr. Nils Eckhoff will also speak. On Feb. 27, at 4.30 PM, at the section of medicine, Colonel V. P. Sydenstricker, UNRRA, Prof. R. B. Hawes, and Wing-Commander McCreary, RCAF, will open a discussion on the clinical recognition of vitamin deficiency. At the section of neurology, on March 1, at 4.30 PM, there will be a discussion on acute meningitis, when the speakers are to be Dr. Maurice Mitman, Dr. E. S. Duthie, and Dr. Honor Smith. On March 2, at 10.30 AM, at the section of otology, Major Frank Lathrop, MC AUS, will speak on the repair of lesions of the facial nerve, and Mr. I. Malcolm Farquharson on the masking effect of sulphonamides in the treatment of acute otitis media. At 2.30 PM on the same day Lieut.-Colonel Ralph Tovell will present a 16-mm. sound-projection apparatus to the section of anæsthetics on behalf of the American Society of Anæsthetists. Afterwards papers will be read by Air Commodore R. R. Macintosh and Dr. W. W. Mushin. At the section of laryngology at the same hour Mr. F. C. W. Capps, Mr. E. Gwynne Evans, Mr. Arnold Nove, and Miss Van Thal will open a discussion on an upper-respiratory clinic for children.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED FEB. 10

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1466; whooping-cough, 1518; diphtheria, 402; paratyphoid, 2; typhoid, 6; measles (excluding rubella), 20,627; pneumonia (primary or influenzal), 1449; puerperal pyrexia, 133; cerebrospinal fever, 94; poliomyelitis, 5; polio-encephalitis, 0; encephalitis lethargica, 1; dysentery, 324; ophthalmia neonatorum, 63. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Feb. 17 was 1083. During the previous week the following cases were admitted: scarlet fever, 49; diphtheria, 24; measles, 135; whooping-cough, 24.

Deaths.—In 126 great towns there were no deaths from enteric fever, 2 (0) from scarlet fever, 14 (0) from measles, 14 (1) from whooping-cough, 5 (0) from diphtheria, 56 (6) from diarrhœa and enteritis under two years, and 67 (13) from influenza. The figures in parentheses are those for London itself.

Leeds and Birmingham each reported 7 deaths from diarrhœa. There were 3 fatal cases of whooping-cough at Liverpool.

The number of stillbirths notified during the week was 218 (corresponding to a rate of 30 per thousand total births), including 19 in London.

Appointments

BLACKWOOD, RUTH, MB LEEDS: registrar to the ear, nose, throat and ophthalmic departments of Chester Royal Infirmary.

DUNN, D. M., MB DURH., FRCSE: first asst., accident dept., Radcliffe Infirmary, Oxford.

MCCORMICK, I. S., MB GLASG.: asst. TO for Fife.

MANIFOLD, J. A., CB, DSO, MD EDIN., KHP, major-general: deputy medical superintendent Botleys Park Hospital.

PRICE, R. E. A., MB LOND.: dermatologist, Royal Bucks Hospital, Aylesbury.

SMITH, MARY, MD LOND., DRCOG: asst. MOH for Wembley.

Births, Marriages, and Deaths

BIRTHS

BEDDARD.—On Feb. 13, at Windermere, the wife of Capt. F. D. Beddard, RAMC—a daughter.

BREACH.—On Feb. 15, at Orpington, the wife of Dr. Alan Breach—a son.

BURTON.—On Feb. 14, at Bristol, the wife of Lieutenant J. S. Burton, RAMC—a son.

EVANS.—On Feb. 14, at Sheffield, the wife of Dr. Sinclair Evans, of Bakewell—a son.

EVANS.—On Feb. 15, in London, the wife of Dr. W. G. Evans—a son.

GORDON.—On Feb. 12, at Liverpool, the wife of Prof. R. M. Gordon, FRCP—a son.

HOPE.—On Feb. 11, at Woking, the wife of Dr. Eustace Hope—a son.

JOBSON.—On Feb. 13, the wife of Major P. H. Jobson, RAMC—a daughter.

LATHAM.—On Feb. 18, at Sherborne, the wife of Surgeon-Lieut.-Commander W. J. Latham, RN—a son.

MCGAVIN.—On Feb. 9, at Leicester, the wife of Mr. Donald McGavin, FRCS—a son.

MACMANUS.—On Feb. 10, in London, the wife of Surgeon Lieutenant Niall MacManus, RNVR—a son.

SITA.—On Feb. 11, at Southport, the wife of Surgeon Lieutenant E. G. Sita, MRCP, RNVR—a son.

TOWN-JONES.—On Feb. 14, at Farnham, Surrey, the wife of Dr. E. M. Town-Jones—a daughter.

MARRIAGES

MANNING—WEBBER.—On Feb. 7, in London, Frederick Everard Beresford Manning, MD, lieut.-colonel IMS, to Elizabeth Robina Webber.

PATTISON—ANDREWS.—On Feb. 5, at Colombo, Peter Pattison, surgeon lieutenant RNVR, of Sheffield, to Mary Andrews, WRNS.

WILDY—KENION.—On Feb. 3, in London, Peter Leete Wildy, MRCS, of Wadhurst, Sussex, to Joan Kenion.

DEATHS

ANDERSON.—On Feb. 17, in London, Charles Macdonell Anderson, MD EDIN.

BOLTON.—On Jan. 26, at Durban, Frank Elliott Bolton, MRCS, surgeon captain RN retd.

CURL.—On Feb. 10, at Overstrand, Norfolk, Henley Frank Curl, BA CAMB., MRCS, recently of Wokingham, Berks.

GALBRAITH.—On Feb. 11, in London, Ernest Edward Scott Joseph Galbraith, LRCPE, DPH, formerly of York.

GRAHAM.—On Feb. 16, at Darlington, James Herries Graham, MB DURH., major RAMC retd.

KELLY.—On Feb. 10, at Desford, Thomas William Gordon Kelly, MD DUBL.

STURDEE.—On Feb. 12, at Little Walsingham, Norfolk, Frederic Herbert Sturdee, FRCSE, aged 71.

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THE VALUE OF WORK IN TREATMENT OF TUBERCULOSIS *

FREDERICK HEAF, MD CAMB., MRCP
SENIOR MEDICAL OFFICER, LCC PUBLIC HEALTH DEPT.

THE use of work as a therapeutic measure in the treatment of tuberculosis begins with Marcus Paterson's bold and enterprising methods at Frimley during the years 1910–16. Prior to this day gentle exercises had been prescribed, but the attitude of physicians in general was to forbid any form of labour to the tuberculous, particularly movements involving the muscles of the thorax and upper extremities. That period I would call the pre-Patersonian era, when work was taboo and the mild exercises prescribed by the less cautious physicians were quite arbitrary and unrelated to clinical observations on the patient's condition.

UNPRODUCTIVE AND PRODUCTIVE WORK

Paterson brought order out of chaos by instituting a rigid system of rest and graduated exercises controlled by careful recordings of the patient's temperature, pulse-rate, and opsonic index. His theory of auto-inoculation may not have been correct, but it was a foundation on which he could build a controlled form of treatment which took the patient with reasonable safety from absolute rest in bed through all the grades to heavy work. Unfortunately, the discipline imposed on both physician and patient for the successful application of the strict routine of this treatment, combined with the lack of variation of the exercises, induced boredom and depression in many patients which often gave way to irresponsible behaviour on discharge from the sanatorium. The regimentation of patients to accurately graded but monotonous labour, often of a simple and almost childish character, did not stimulate that confidence and hope of return to remunerative employment which we now know is essential if the patient's full coöperation is to be gained in our efforts on his behalf. Moreover, the long years of military discipline endured by many patients during 1914–19 created a strong aversion to the clockwork regularity of the Patersonian routine and it was not easy to persuade them that the discipline of the treatment was essential for their successful recovery from the disease.

At Papworth, Sir Pendrill Varrier-Jones, visualising the psychological value of productive employment as a stimulus to work, disregarded the scientific basis of Paterson's treatment and began to give patients industrial work which eventually had an economic value that could offer a means of livelihood under the ideal environment of a village settlement. In doing this he created for the patient a vista of hope by repressing the invalid complex and encouraging the man's confidence in himself as a worker. The monotony of the daily repetition of set exercises was replaced by the thrill of productive industry. But this gain was effected by the loss of careful graduation of energy output, and assessment of working capacity was based more on trial and error than on careful clinical observation and laboratory investigation.

The remarkable growth of the industries at Papworth gave Sir Pendrill an ever-widening opportunity to cater for the employment of the great variety of patients attracted by the prospect of security and permanent employment within the shelter of the village settlement. At one stage it seemed that the industrial clinic would overshadow the primary object of the venture which was, of course, the cure of tuberculosis. Happily that danger has been averted by concentrating on the individual requirements and treatment of each employee as a medical case requiring continuous care and observation, even though his work may have a high economic value.

Concurrently with the decline of Patersonian methods and the development of occupational therapy an increase in the use of collapse therapy was taking place throughout the country. That had a profound effect upon the use of graduated exercises as a means of treatment and has completely shattered the auto-inoculation theory. It has however encouraged physicians to focus their main attention on the pulmonary lesion and has lessened their consideration of the many sociomedical and psychological problems which are peculiar to each patient. Serial radiography further helped to spotlight the lesion, throwing the patient's personality and general reactions into the surrounding darkness.

DIVERSIONAL THERAPY AND REST

It is not surprising, therefore, that some medical superintendents not fully acquainted with Paterson's methods and the benefits of a strictly regular sanatorium routine as a therapeutic measure have relied almost entirely on collapse and chemotherapy to produce results. Others, seeing the obvious advantages of relieving the enforced idleness of patients by work, and remembering the old proverb that Satan finds mischief for idle hands to do, have grasped at the shadow of Papworth and instituted handicrafts. So long as these efforts at keeping the patient occupied are regarded as diversional therapy, all is well, but such employment must not be confused with the real productive occupational therapy of an industrial settlement or the strict graduated exercise therapy which Paterson developed at Frimley.

Diversional therapy has a psychological value in relieving the introspective boredom which encourages disobedience and is so often present in sanatoria where no work of any kind is organised, but it has dangerous consequences if patients are allowed to accrue considerable profits by the private sale of the articles they make. All financial arrangements connected with both diversional or occupational therapy should be centrally controlled and an encouragement grant of from 5*s*. to 10*s*. per week paid to those who make saleable goods. If this is not done there is a real danger of the patients' zeal to amass a little fortune interfering with his clinical progress. Just as the clinical side of occupational therapy needs placing on a regular basis, so the financial side must conform to a system that prevents harm from over-exertion but, at the same time, induces the patient to progress along the road to full rehabilitation.

In my peripatetic duties I am often distressed to see how truly some sanatoria have become what Paterson called "homes for tuberculosis." Discipline is at a discount, and, except for meal times, the patients are left to their own resources as regards occupation and amusement. A pretence at graduated exercises is made by a weekly instruction to do one, two, or four miles, or maybe to walk to the nearest cross-roads, maybe passing the local pub on the way; but little or no attempt is made to find out if the prescription is being carried out conscientiously. Handicrafts may be encouraged, but the patient too often buys his own material and conducts his own business even to the exploitation of his fellow patients. All this is thoroughly bad and has no therapeutic value whatsoever.

Rest hours, too, are often times for political arguments or incubation periods for the hatching of complaints. The importance of controlled rest as an adjunct to work therapy has long been appreciated in sanatorium practice, but there has been too little attention paid to instructing patients how to obtain the full benefit from the rest period. The art of relaxation is one which few patients acquire without tuition, and I suggest that the full value of mental and muscular relaxation has not been fully explored in the treatment of tuberculosis. It is a field awaiting the attention of the physiotherapist, but the majority of us could do a great deal more in our own institution to increase the beneficial effect of the rest hours to which so much lip service has been paid in the past.

With the pioneer work of Paterson, Varrier-Jones, and McDougall before us, and the support of the benefits under memorandum 266T and the Disabled Persons Employment Act, the development of a full rehabilitation scheme to run alongside of the clinical treatment awaits our immediate attention and thought.

A DISCIPLINED ROUTINE

H. A. Pattison, of the Potts Memorial Institute, has written: "The most important requisite for full recovery from tuberculosis is a good, sound, solid

* Address to the Tuberculosis Association on Nov. 17, 1944.

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character." Bearing this in mind, I sometimes feel that in our treatment of the disease we often fail to realise our responsibilities to prepare the patient both mentally and physically for carrying out the regular routine we advise him to adopt in his post-sanatorium life. Perhaps the worst we do is to present him with a time-table and a set of rules when he enters the institution, and leave him to discover that none is kept by other patients except punctuality at meals. Better no rules at all than a code that is ignored by both staff and patients alike.

You may say "But what has work to do with discipline and discipline with work"? I would answer that by instituting a well-graduated programme of work and rest therapy, with proper control and supervision, you lay the foundations on which to build a sound structure of regulated sanatorium routine. For work therapy not only strengthens character and reliability in the patient, but it also demands frequent and periodic examinations and tests by the physician to enable him to assess the capacity and adaptability of the patient to the work. It demands vigilance and constant observation by the staff, which cannot be maintained without discipline.

From village settlements we have learned the most suitable occupations at which our patients can be employed both in productive industry and in staffing our institutions, and more can be learned by frequent visits to such centres. By making these visits you will come to appreciate that the task is not easy either for the physician or the patient. There is still a large amount of research to be done on both the psychological study of the disease and on methods of assessing the patient's capacity for work. To achieve this our sanatoria must become well-disciplined institutions commanding the respect and confidence of both those within and outside their gates; and though it is increasingly necessary to continue our detailed investigation of the lesion by modern methods and to apply the most recent advances in treatment with critical and balanced minds we must not let the trial of such procedures deflect our course from the ultimate aim of returning the patient to productive work. Completely successful treatment means that the patient returns to normal life and is able to earn an adequate wage at a useful occupation. Collapse therapy alone will not ensure this, neither will graduated exercises or occupational therapy. To obtain this satisfactory result in the largest number of cases requires early diagnosis, facilities to administer modern methods of treatment, and a well-planned rehabilitation programme. In this latter part three factors play important rôles—discipline, assessment, and work—three factors which in many of our sanatoria are lamentably neglected.

ASSESSMENT

In assessing the patients' capacity for work, the present practice of relying on temperature and pulse-rate records, with an occasional sedimentation test, is insufficient to enable us to predict with any degree of certainty that a patient may undertake work requiring a known energy output. Evidence of cavity closure or retrogression of radiographic shadows is always welcome, but it does not necessarily indicate fitness for work. In fact many patients with open cavitation can be safely employed at occupations which would be dangerous to many with minimal lesions. Controlled diversional therapy can be undertaken with beneficial results by many patients with active disease, and occupational therapy can be safely prescribed to patients with extensive radiographic shadows provided we keep within their capacity for work. Orr and Leitch have estimated with considerable accuracy the energy required, in calorie-hours, to perform certain types of labour. These tables, which have been published,[1] are a basis upon which future research can be built. We need a simple and practical method of finding the maximum amount of energy which each patient can safely expend. When we know this figure we can direct him to take up an occupation which demands an energy output that is below the known safety figure.

Much research is being done on these lines at Papworth, Preston Hall, and other rehabilitation centres, and I look forward to seeing this work extended to all large sanatoria in the country. When this occurs the discharge report on any employable patient will not deal mainly with physical signs, radiographic reports, temperature and pulse records, but will give information on the physical and psychological fitness of the patient for certain types of work for which he has been proved suitable by physiological and other tests. Here is a new field of work for all of us, and the more we explore this ground the greater will be the assistance we can give to the patient and his future employer by being able to state with reasonable confidence the type of work for which any individual is most suitable.

It has been estimated that there are at least 20,000 occupations by which people can earn a living. Nobody has made a complete list of occupations suitable for the tuberculous. I doubt whether it would be possible to do so, because every job is qualified by such factors as environment, remuneration, hours of work, and living conditions. In recommending a patient for any particular employment these factors must be taken into account along with the estimation of his capacity for work.

At a village settlement or at a sanatorium the living and working conditions approach nearer to the ideal for the tuberculous than anywhere else. It is for this reason that we should endeavour to employ as many ex-patients on the staff of a sanatorium as possible. If our patients are unable to find refuge in these safe harbours they should be able to anchor in the calm waters of sheltered industries either in special workshops or in modified employment in normal industry. Only those who are fully seaworthy should be allowed to brave the storms of the open labour-market where efficiency, speed, and mass production methods put strain on the weak places and may cause such irreparable damage that the craft may never put to sea again. The shores of the tuberculosis world are strewn with too many such wrecks, many due to having set out on voyages which they were totally unfit to undertake. It is our duty to prevent those at present under repair from meeting a similar fate.

1. Orr, J. B., Leitch, I. *Nutr. Abstr. Rev.* 1938, 7, 509.

EXFOLIATIVE DERMATITIS TREATED WITH CYSTINE

REPORT ON TWO CASES

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CASE 1.—A man, aged 56, had been treated by the late Dr. N. Burgess for several years for severe recurrent seborrhoeic eczema. He was admitted to Ham Green Hospital on Feb. 10, 1939, supposed to be suffering from erysipelas. He said he had been suffering from recurrent attacks of exfoliative dermatitis and eczema for the previous 4 months. On admission his temperature was 100·6° F, pulse-rate 128 per min., and general condition poor; exfoliative dermatitis involved the whole skin of the body, including the face and eyelids. On the trunk were large patches covered with crusts from the weeping eczematous areas. He was treated with flavine 1 in 1000 and paraffin locally and 'Proseptasine' 1 gramme four-hourly internally.

His temperature slowly subsided, becoming normal at the end of a week. During the next 4 months the patches of eczema recurred, chiefly on the trunk, while the extensive exfoliation of the epithelium continued on the remainder of the skin. He was given vitamins A, B_1, C, and D, and nicotinic acid with no improvement; in fact his general condition was steadily deteriorating and his appetite was extremely poor. On June 1 he became mentally confused and noisy, and œdema of the feet and legs appeared. On June 7 the œdema invaded the arms and the whole of the trunk with associated ascites. By now he had become comatose and was apparently dying.

During the period June 1–7 the exfoliated scales were collected from his bed daily. The average daily weight of epithelium shed was 19 grammes per day. At that time the total intake of protein was not more than 50 g. daily, so this loss of epithelium represented about a 40% loss of his total protein intake. Since epithelium is a keratin-like substance and human hair keratin is known to contain a high proportion of cystine (15%), and since no information was available as to

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the proportion of cystine in human epithelium, I carried out the following estimations with the help of Dr. N. Cunningham. The scales were first dried in a vacuum desiccator to constant weight and the amount of sulphur in the scales was estimated by grinding the scales to powder, fusing in the presence of sodium peroxide and bicarbonate, converting the sulphur into $BaSO_4$, weighing the precipitate, and calculating the sulphur as cystine. Two experiments showed that the epithelium contained 3·11% and 3·19% of cystine, assuming all the sulphur was present as cystine. In drying the scales lost 13% of their weight. As a control I collected desquamated skin from the hands of men recovering from scarlet fever, and the amounts of cystine in their epithelium were estimated to be 2·68%, 2·34%, 2·54%, 2·05%, and 2·39%. Calculated on the amount of protein in his diet, the patient was therefore taking in about 1·5 g. of cystine and losing through the skin 0·52 g. daily. His total input was not more than 50 g. of protein daily, which is usually considered the minimum for an adult for maintaining nitrogenous equilibrium, so he was probably taking too little protein to maintain life—hence the generalised anasarca, which was probably a hunger œdema.

From June 10 the patient was given 0·25 g. of cysteine hydrochloride subcutaneously and 1 g. of cystine by mouth daily. On the 13th an immense diuresis started. The volume of urine could not be measured because he was incontinent. By the 19th he had an extraordinary shrunken appearance, owing to the loss of water, but he was mentally clear and began to eat well. The skin lost its angry look, desquamation ceased, and in a few days the skin became normal. Besides the local improvement, his general condition greatly improved and by July 21 he appeared well. In all, 2 g. of cysteine was given subcutaneously and 10 g. of cystine by mouth. At the end of 10 days, as he was eating well, the cysteine and cystine were stopped. On July 27 he developed a weeping eczematous patch on the abdomen with a pyrexia of 101° F, but with no return of the pityriasis on any other part of his skin. *Staphylococcus aureus* was recovered in pure culture from the skin; a vaccine was made from this and fifty million organisms were given sub cutem on Aug. 6. On Aug. 7 the patient appeared acutely ill, with a frothy sputum and signs of generalised œdema of the lung. He died on Aug. 8. An autopsy revealed œdema of the lung, and histological sections showed advanced emphysema, with no inflammatory reaction. The remaining organs were healthy. Presumably the acute œdema of the lungs was an allergic reaction to the vaccine, a very painful and unexpected occurrence.

CASE 2.—A woman, aged 69, was admitted on Sept. 15, 1943. She gave a history of inflammation starting on the foot 4 months previously and gradually extending up the legs on to the trunk. Her general condition was very poor. The skin on both legs, abdomen, and back was angry looking and was covered with thick desquamating flakes on the affected areas. She also had chronic bronchitis.

She was treated first with 'Sulphamezathine,' a good diet, and all the vitamins A, B_1, C, and D, 'Marmite,' and nicotinic acid up to Oct. 18, with a calamine lotion locally. Her general condition improved but the local condition spread further without improvement. She was then given 1 g. of cystine by mouth for 20 days, and began to improve slowly. The skin became normal and she was discharged on Dec. 22 in good health and with a normal skin.

This patient had been existing for several months on a diet deficient in every respect, so I suggest her condition was due to an insufficiency of the essential amino-acids. Unfortunately in her case it was not possible to carry out similar estimations.

DISCUSSION

Pityriasis rubra (exfoliative dermatitis) is of two types. One is an acute disease with high fever and intense toxæmia, and may end fatally or recover completely. These cases occasionally reach fever hospitals with a diagnosis of scarlet fever. The other type is very chronic, tending to follow chronic eczema or psoriasis, liable to recurrences, and usually very intractable. I suggest the following pathology for the latter type.

An extensive chronic destructive damage to the skin drains protein from the body in its attempt to restore the epithelium, besides the losses in plasma exuded from the raw surfaces. Owing to this drain there may not be sufficient sulphur-containing amino-acids available to provide materials for building normal epithelium. If the epithelium so constructed is made of unsuitable amino-acids it may split and be shed as soon as it is formed. It is noticeable that my controls showed about 20% less sulphur in the epithelium than the case investigated. This might suggest that in the diseased epithelium the organism was trying to build the skin with cystine instead of with a proportion of methionine,[1] as the proportion of sulphur in cystine to that in methionine is as 5 to 4.

Dr. F. J. Lewis suggests that the controls could not be regarded as normal, or why should the skin peel after scarlet fever? This objection is not entirely valid, for the bulk of the shed skin after scarlet fever was laid down during health, although the synthesis of the deeper layers may have been interfered with by the toxin, as might also occur in the similar condition sometimes seen after gold or arsenic administration. The best control material would probably be the epithelium raised by an extensive scald, but this was not available at the time. It is practically impossible to obtain a corresponding specimen from post-mortem skin, because such specimens would be certain to contain parts of the skin papillæ.

If a high proportion of essential sulphur-containing amino-acids are being squandered by the skin, insufficient are left to build the serum-proteins—hence the hunger œdema in case 1. Possibly there was a shortage of glutathione also in this patient for the same reason, accounting for his profound depression and mental disturbance, as this substance plays some part in the oxidative processes in the body. If an excess of anaerobes are present in the gut they may destroy the sulphur amino-acids before absorption, for some of these bacteria need cysteine to develop their enzymes. After such foods as peas, beans, or eggs in excess most people pass flatus obviously containing H_2S, so some destruction of sulphur amino-acids can easily occur in the gut and might become dangerous. Numerous *Cl. welchii* were found in the stools of case 1, but it was impossible to say if they were present in abnormal numbers.

The remarkable effect in case 1 of injecting cysteine could hardly have been a coincidence. It is now known that the only essential sulphur amino-acid is methionine. It must be convertible in the body to cystine but the reverse apparently cannot occur. If enough cystine is available it would presumably prevent the conversion of some of the more essential methionine into cystine; hence the benefit of giving cystine or cysteine. The fact that diuresis did not occur until the patient had had 5 g. in all of cystine and cysteine suggests that it was due to the synthesis of serum-protein, but it is, of course, possible that cysteine in abnormal concentration may have a diuretic effect in itself. The effects in case 2 were less dramatic, but here again cystine by mouth led to a complete recovery.

To prove these ideas it would be necessary to investigate the proportions of sulphur-containing amino-acids, methionine, cystine, or cysteine, in normal epithelium and also in the epithelial scales shed in exfoliative dermatitis. Of course, other amino-acids might be involved, but the response of these cases to treatment suggests that the chief lack is in essential sulphur amino-acids.

Such cases are rare in the practice of this hospital, and these results are published in the hopes that those with better opportunities may carry out further investigations on these lines.

SUMMARY

In two severe cases of exfoliative dermatitis rapid improvement in the skin and general condition followed administration of cystine or cysteine. In the first case some 40% by weight of the protein intake was being lost in the desquamated skin. The cystine content of this skin was found to be 3·15%, whereas in scarlet fever patients the cystine content of desquamated skin averaged 2·4%.

It is suggested that patients who are losing large quantities of epithelium from any cause are liable to suffer from lack of sulphur-containing amino-acids.

1. J. M. R. Beveridge and C. C. Lucas (*Biochem. J.* 1944, **38**, 88) have shown that human hair keratin contains 1% of methionine.

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NITROGEN LOSS AFTER THERMAL BURNS

EFFECTS OF ADDING PROTEIN AND METHIONINE TO DIET OF RATS

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OUR object was to determine whether the feeding of high-protein diets to animals would diminish the tissue wastage and loss of nitrogen (N) in the urine following burns, and whether a single amino-acid or a mixture of a few essential amino-acids could replace the total protein.

Influence of Increased Protein Intake

It has long been known that injury produces a metabolic disturbance with losses of N in the urine: in a series of papers from 1930 onwards Cuthbertson and colleagues have reported investigations on man and animals suffering from injury due to fracture and tissue laceration (reviewed by Cuthbertson 1942a). From work on fracture cases (Cuthbertson 1936) it was concluded that "diets rich in first-class protein, and containing the maximum of calories which the patient could consume failed to eliminate the negative nitrogen balance at the height of the katabolic process in many cases of fracture due to direct violence." With less tissue damage the effect of increased protein intake was more favourable.

Turning to the special problem of burns, Lucido (1940) in one patient observed a high output of urinary N (as well as azotæmia), and Black in 1941 drew our attention to this phenomenon in one of his patients. In animals, Clark, Peters, and Rossiter (1943) showed that, on a diet containing 10% casein and 10% dry yeast as a source of protein, rats lost weight and developed a negative N balance after a burn; and this negative balance continued after the period of hæmoconcentration was ended. They demonstrated also a sharp rise in blood non-protein nitrogen (NPN), a slight fall in the total plasma protein and a marked fall in the plasma albumin, giving a decrease in the albumin/globulin ratio. There was a tendency towards increase of N loss with increase in the temperature of the burn. The condition produced in these animals formed the starting-point for an investigation of the effect upon these N losses of increasing the dietary protein. In patients recently, Taylor, Levenson, Davidson, Browder, and Lund (1943) confirmed the large N deficits after burns, and produced evidence that large amounts of protein, up to about 290 g. per diem, would correct this loss. Anderson and Semeonoff (1944) have also found extensive N losses in the urine of severely burned patients.

METHODS

White rats weighing 100–150 g. were used. Substantially, the technique of Clark et al. (1944) was employed for the metabolic work.

Feeding.—The diets were:

—	Basal diet	Increased-protein diet
Wheat starch	70	70
Casein	10	20
Dry yeast	10	10
Salt mixture	5	5
Agar-agar	2	2
Cod-liver oil	3	3
—	100	110
Water (approximately) ..	60	65

Enough water was added to make into a consistent dough, the amounts given above being approximate. Vitamin B_1 concentrate 28 mg. (containing 0·2 mg. aneurin) was added to every 70 g. of wheat starch. This addition of vitamin B_1 was necessary because estimations kindly made by the late Mr. H. W. Kinnersley in this department showed that the aneurin content of the yeast used was low (300 µg per 100 g.). For convenience in making up the diet, the basal mixture containing 70% starch was supplemented by the extra casein, and the changes so induced in the proportions of the remaining constituents neglected; these are actually very small.

As Cuthbertson, McGirr, and Robertson (1939) found, the ingestion of a known amount of food each day must be ensured. Unless otherwise stated, the rats were given 15 g. per diem of the dough for a preliminary period of approximately 10 days, until sufficiently steady conditions were reached. If more food or longer periods were required to reach a balance, additions up to an extra 5 g. were given and the time sometimes extended to 3 weeks. Unlimited drinking water was given.

The rats were withdrawn from the metabolism cages for two periods daily—10 AM to 12 noon and 3.30 to 4.30 PM—and fed in glass bowls. The urine was collected in decinormal sulphuric acid for the remaining 21 hours per diem, using a modification of Hopkins's method for separation of the urine and fæces. Elimination of all food from the metabolism cages avoided contamination of the urine samples; further, no loss of food could occur through the wide-meshed floor of the cages.

After the first two or three days the animals ate their food completely. During the first 24 hours following the burn, conditions were disturbed and up to 5 g. was apt to be left unconsumed. The slight loss of urine during the 3-hour feeding periods has been thought less objectionable than errors induced by feeding the rats in their cages.

Burning.—Rats were anæsthetised with ether and burned by immersion of the back (approximately one-third of the body surface) in hot water at 73° C for 30 sec. The hair was not clipped. A few experiments were done at 75° C but the temperature was reduced because of the heavy mortality-rate. With burns at 73° C the loss of animals was less than 1%. Controls were similarly anæsthetised but not burned. These burns led to destruction of the dermis and epidermis; a hard scab quickly formed with almost no oozing in most experiments. Occasionally areas of the scab became detached, possibly by scratching, but this did not appear to upset the experiment. In two animals kindly examined by Mr. R. L. Vollum, D PHIL., no bacteria were found in the scabs and underlying tissue.

Estimation.—Nitrogen estimations of urinary urea+ammonia were determined by the method of Conway and O'Malley (1942) and of creatine and creatinine by that of Folin (1913). Throughout the paper, unless otherwise stated, "urinary N" means "urinary urea+ammonia N." Each day's urine plus the washings of cage and funnel was made up to 100 c.cm. with decinormal acid and filtered. This was diluted 1 in 10, and 0·2 c.cm. taken for N analysis.

When required for analysis the fæces were stored in acidified alcohol (Mitchell 1923) separately for the preliminary period and for 9 days after burning; the grouped fæces were ashed and total N determined by micro-Kjeldahl.

RESULTS

In a preliminary group burned at 75° C, six animals on the basal diet showed urinary losses averaging 300 mg. urea+ammonia N in the 10 days following the burn, as compared with the mean daily output in the 4 days preceding the burn. This confirmed the previous observations in this department of Clark et al. (1944). Compared with these, five rats maintained from the start on the raised protein diet (18% casein) showed a corresponding loss of 90 mg. N. Some observations upon the excretion of creatine in these rats are recorded in Appendix I.

These results, though not statistically significant, suggested that a high-protein diet was beneficial: the experiments on the basal diet were then repeated on a group of seven animals burned at 73° C; again a loss of N occurred. This led to the final planned curative experiments, which will be reported in full.

In these the animals were paired, one of each pair being ultimately burned and the other kept as a control; each pair of animals was selected to have approximately the same weight and excretion of N on the basal diet. Four pairs of rats were used at one time; later six, making twelve metabolism cages in use at one time. At the start all the animals were on the basal diet; after the 4-day period during which urinary estimations were made to ensure a sufficiently steady excretion, the animals were anæsthetised, and one member of each pair burned. From this time the animals were placed upon the experimental diet, either the raised protein or a continuation of the basal diet.

The individual values for the daily excretion of urinary N for eight pairs of animals on the basal diet are

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TABLE I—DAILY URINARY UREA+NH_3 NITROGEN EXCRETION (MG. N PER 21 HRS.) OF RATS ON THE BASAL DIET

Rat	Days 0	1	2	3	4	5	6	7	8	9	10	11	12	13
Control animals														
*DF	141	142	126	141	125	118	138	143	147	150	152	144	133	149
*DG	116	137	124	114	118	117	114	117	122	122	127	143	127	134
*DR	143	130	134	112	131	146	144	154	164	149	154	161	205	175
*EB	151	123	121	93	115	144	119	138	135	148	111	115	134	149
EE	150	122	120	101	128	121	138	147	126	171	144	149	160	165
EO	183	169	178	146	131	154	163	138	174	166	147	138	154	163
ES	152	142	115	101	85	143	150	137	132	125	130	146	137	150
EV	154	156	150	150	134	137	118	114	125	140	120	129	144	135
Mean	149	140	134	120	121	135	136	136	141	146	136	141	147	153
Animals burned on day 3 at 73° C for 30 sec.														
*DI	151	132	140	137	156	165	181	201	202	200	199	202	172	179
*DJ	159	131	156	113	132	125	150	180	157	176	171	190	181	145
*DX	148	152	145	127	212	203	204	187	218	188	171	145	173	152
*DU	127	92	128	135	103	165	223	191	184	186	185	175	148	159
EG	175	158	159	139	177	154	204	190	209	216	193	183	193	203
EN	102	102	126	133	187	164	190	166	198	190	147	136	120	119
ER	118	118	116	96	163	168	146	165	172	170	174	170	170	167
EU	127	123	112	130	149	158	174	136	141	172	178	191	170	159
Mean	138	126	135	126	160	160	187	177	185	187	177	174	166	160

* 20 g. food per diem.
DR, DX, and DU males, all the rest females.

TABLE II—DAILY URINARY (UREA+NH_3) EXCRETIONS (MG. N PER 21 HRS.)

Rats on basal diet for days 0–3 inclusive, and then both control and burned animals placed on raised-protein diet from day 4 onwards.

Rat	Days 0	1	2	3	4	5	6	7	8	9	10	11	12	13
Control animals														
CD	119	134	131	72	123	121	255	168	84	82	282	274	139	298
CE	124	93	124	99	130	202	200	200	206	181	233	179	194	195
CH	117	130	116	122	127	212	210	211	186	211	224	222	199	212
CJ	131	125	123	123	117	208	180	202	241	216	247	242	196	227
CM	140	120	136	126	103	184	218	209	209	198	178	188	205	219
CP	117	154	147	135	114	173	208	192	239	219	220	213	208	204
CS	123	123	145	138	123	196	196	200	208	181	200	176	253	152
Mean	124	124	132	119	120	185	210	197	196	184	226	213	199	216
Animals burned on day 3 at 73° C for 30 sec.														
CF	144	133	147	136	107	125	173	164	172	175	188	185	169	158
CG	117	105	116	136	136	200	226	202	235	307	222	224	215	185
CK	131	128	132	129	151	179	214	231	226	204	255	230	218	203
CI	141	124	134	106	120	142	205	275	244	236	225	205	229	212
CL	103	95	120	108	94	167	195	154	119	199	232	197	201	179
CQ	111	135	95	127	152	213	221	195	257	240	201	234	214	224
CR	125	127	125	129	149	219	235	261	235	244	234	240	241	184
Mean	125	121	124	125	130	178	210	212	213	229	223	216	213	192

All female rats.

shown in table I. Similar values for a curative experiment on seven pairs of rats with the increased protein diet are given in table II. The mean values of the daily N excretion and weights of the animals are plotted in fig. 1 and the mean cumulative N excretion for the burned and control groups on the two diets in fig. 2.

In calculating the cumulative excretion of N, the values for the 24 hours following the burn or anæsthesia have been excluded because the animals were still on the basal diet during the first day, and because the portion of the daily ration left for the afternoon feed was incompletely consumed after the burn, making excretion values unreliable.

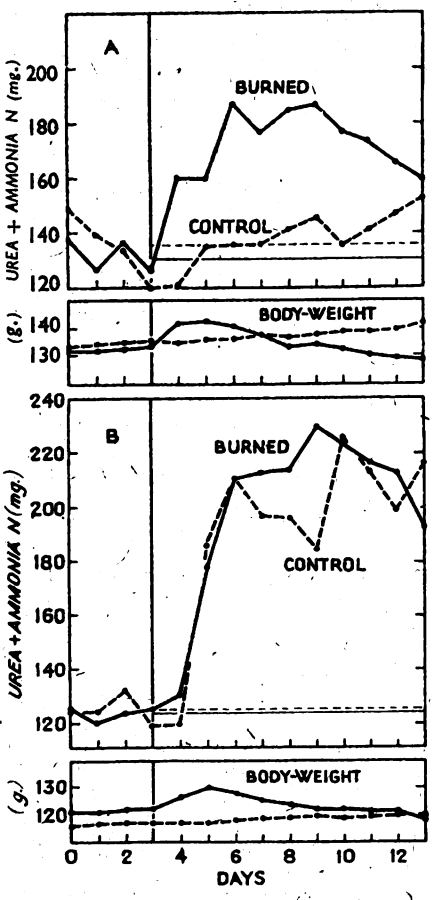

Fig. 1—Mean daily urinary nitrogen (urea+NH_3) excretion, and body-weight curves. Burns at 73° C for 30 sec. A = basal mixture + 10% casein. B = basal mixture + 18·2% casein.

On the basal diet the mean total loss in the 9 days is 301 ± 107 mg. N for the burned animals, as compared with a mean loss of 61 ± 192 mg. N on the raised protein diet. Comparing the means for the excretion of the control and burned animals from days 5–11 inclusive, using Fisher's formula (1941), the differences in the means are highly significant for the rats on basal diet, there being less than a 1 in 100 possibility that they could arise by chance selection ($P < 0.01$). On the raised-protein diet, however, the differences are not significant ($P = 0.4–0.3$). Hence there is proof that in these animals raising the dietary protein is beneficial.

DISCUSSION

This study is confined to the first 10 days after burning. The mean loss of urinary nitrogen on the diet of higher protein content is actually less than the N loss on a diet of 11% yeast as the sole source of protein. In one set of experiments not reported in full, a group of six animals which were burned at 75° C while maintained on the casein-free diet showed a mean loss of 130 mg. N in 10 days. This reinforces the argument about the value of more protein. In our basal diet, including 10% casein, the yeast supplied about 4% of good-quality protein; so that the total protein content was about 14% (by analysis the N content was 2·32% of the dry mixture).

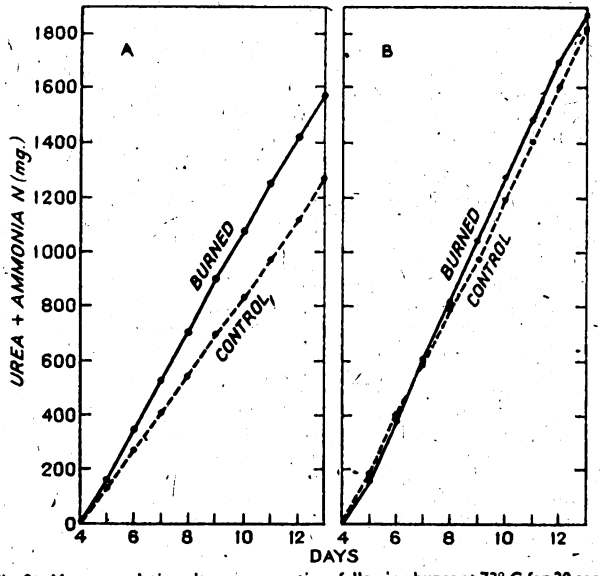

Fig. 2—Mean cumulative nitrogen excretion, following burns at 73° C for 30 sec. A = basal mixture + 10% casein. B = basal mixture + 18·2% casein.

In man, a diet in which 14% of the calories consist of protein of good biological value might be considered a good diet for the adolescent. It is, however, difficult to arrive at a direct comparison between the protein requirements of the rat and of man, owing to the great differences in rate of growth and of metabolism.

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McCollum and Davis (1915) found that the lowest plane of protein intake for maintenance of the growing rat is 3% milk protein, and that a progressive increase in the rate of growth is induced by increasing the dietary protein from 3% to 8%. Osborne, Mendel, and Ferry (1919) got "normal growth in rats" with a 12% casein diet, and Mitchell (1923) showed good growth with 10% casein. More recently Hamilton (1939) found that the minimal percentage of whole-egg protein capable of giving maximum growth in rats lies between 12 and 16, noting that young rats of less than 125 g. which are growing very fast probably need 20% protein if the growth-rate is to be maximal. Hamilton also found no appreciable change in the growth-promoting value of diets containing up to 42% protein as against 16% protein, while at even higher protein contents up to 54%, the growth-promoting value definitely decreased.

Though we realise that much nutritional work in the rat has been done with diets containing approximately 20% casein, this is above the amount necessary for rats of the weights used in these experiments. It seems safe to assume that a diet of approximately 14% protein content should be substantially adequate for maintenance. Thus 22% would be an amount above ordinary requirements, and probably the equivalent of a rather high protein intake in man.

There is no reason to believe that the method of divided feeding complicates our interpretations. Mitchell (1923) investigated divided feeding and found that on a raised-protein diet the utilisation of protein was slightly greater with three feeds a day than when the protein was given in a single daily feed. Our method of feeding twice daily should be more satisfactory than a single daily feed, and we think that it forms the most satisfactory experimental compromise.

Our observations of the high mortality-rate produced by burning at 75° C, as compared with burning at 73° C, lend further emphasis to the work of Leach, Peters, and Rossiter (1943), who showed that quite small changes in the temperature at which a burn is made may have very profound consequences for the animal.

In regard to the total N balance, there is no significant local oozing from the scabs; estimations of fæcal nitrogen have not been done in these experiments. At this stage of the investigation nothing less than daily fæcal estimations upon all rats seemed likely to be of value, and this was impracticable. Nevertheless, it would be strange if variations in digestion and absorption by the burned rats could explain the differences produced by the extra 8% casein in the diet. Apart from the inherent improbability that such an exact balance could be produced on the raised-protein diet, it must be noted that the weight curves agree with the urinary changes, which could not happen if extra N was being lost in the fæces. Further, in the experiments to be described in the second part of this paper, estimations of fæcal N made it clear that, with methionine, variations in digestion and absorption cannot explain the results.

Clark et al. (1944) have already found that the non-urea N fraction in the urine after burning is less than 20% of the total N. In a single case at the height of the metabolic disturbance, it was confirmed that urea + ammonia N was 89% of the total urinary N.

In general, our results give striking experimental support to the indications from the work of Taylor et al. (1943) upon patients suffering from burns, and the more recent work of Co Tui, Wright, Mulholland, Barcham, and Breed (1944). It is firmly indicated that where possible high-protein feeding should be the rule in severe burns, and we think that our results justify the suggestion that other clinical conditions where there is a large loss of skin with its proteins should also receive a high-protein diet. It has been suggested already (Clark and Rossiter 1944) that extra carbohydrate should also be of value in the early stages of treatment.

The Influence of Methionine

One possible hypothesis to explain the benefit of increased protein intake is that the loss of N in the urine is due to the raiding of the tissue protein for one or two amino-acids particularly needed for formation of new skin protein, and the elimination of the N from the unwanted amino-acids of the tissue-protein molecule through the kidneys as urea. This led us to examine the effect of the sulphur-containing essential amino-acid methionine, and also of an amino-acid mixture, and of alanine and cysteine.

METHODS FOR THE AMINO-ACIDS

The details of the feeding and of the estimations were as in the previous experiments. Intimate mixing of these amino-acids with the rest of the diet was ensured by grinding the amino-acids and casein carefully in a mortar before adding them.

The diets supplemented by the amino-acid mixture was as follows: To 100 g. of the basal diet, the following were added: *dl*-leucine 0·485 g., *dl*-isoleucine 0·485 g., *dl*-phenylalanine 0·39 g., *dl*-threonine 0·37 g., *dl*-methionine 0·35 g., *dl*-lysine 0·625 g. (as lysine dihydrochloride), *dl*-valine 0·79 g. The total addition was 3·81 g. This mixture was based to some extent upon the amino-acids available and upon the amount of these acids in the extra 10 g. casein added in the previous raised-protein diet.

Amino-acids.—The following were commercial specimens (Merck, USA): *dl*-leucine, *dl*-isoleucine, *dl*-threonine, *dl*-valine; they were accepted as supplied. We are much indebted to the Ministry of Supply for synthetic *dl*-methionine (analytical figures: N 9·3%, S 21·4%, KCl 1·0%), *dl*-phenylalanine (N 8·44%, MP 170°), and *dl*-lysine (as dihydrochloride) (N 13·0%, Cl 32·1%).

In testing the urines for methionine, the colorimetric test of McCarthy and Sullivan (1941) was used.

RESULTS

In a few preliminary experiments, in which rats were burned at 75° C, there were indications that maintaining rats on a basal diet supplemented by 2% methionine had a beneficial effect similar to that produced by an increased protein intake. Controlled maintenance experiments were then done, burning the animals at 73° C. Rats were maintained upon the following three diets for the whole period, including the preliminary period preceding urinary observations: (*a*) the basal diet, containing 10% casein and 10% yeast; (*b*) the basal diet + 2% methionine; and (*c*) the basal diet + 1·2% alanine equivalent in α amino N to 2% methionine. These experiments were done successively and not simultaneously as in the later curative experiments. Table III

TABLE III—MAINTENANCE EXPERIMENTS

Comparison of the nitrogen excretion after burning of rats on (*a*) the basal diet, (*b*) the basal diet + 2% methionine, and (*c*) the basal diet + 1·2% alanine.

A.—*Mean daily urinary urea and ammonia N excretion (mg. per 21 hrs.). Control period 4 days. Rats burned on day 3 at 73° C for 30 sec.*

Diet and no. of rats	Days												
	0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
Basal (15)	119	117	118	114	153	147	156	161	164	160	150	154	154	155
Methionine (9)	128	139	134	135	143	154	143	148	147	140	146	144	141	131
Alanine (9)	124	129	123	138	158	156	146	146	166	171	166	162	168	161

B.—*Mean body-weights of the groups of rats in A*

Basal	140	140	141	140	147	147	145	140	139	138	135	134	133	132
Methionine	137	136	137	137	143	144	144	141	139	139	138	137	136	135
Alanine	136	136	136	136	141	144	142	139	136	136	133	132	130	129

gives the mean N excretion of these rats; amounts of N excreted in the urine in the period succeeding the burn in excess of the mean daily excretion in the preliminary period are given diagrammatically in fig. 3, including analyses for the day immediately following the burning. It will be seen that methionine reduced the N loss whereas alanine did not. This result was statistically significant.

Curative experiments.—These were controlled like the final experiments upon raised-protein diet, with a further improvement in the technique. The animals were grouped in pairs and placed upon the basal diet for the period preceding the burn; after anæsthetising and burning, or anæsthetising only, the animals were retained upon the basal diet or placed upon the basal diet supple-

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mented with 1% methionine or the mixture of synthetic amino-acids as described above. Hence, at any time, four animals out of a group of twelve were on the basal diet, four on the methionine diet, and four upon the amino-acid mixture, while in each group of four, two rats were burned and two kept as controls.

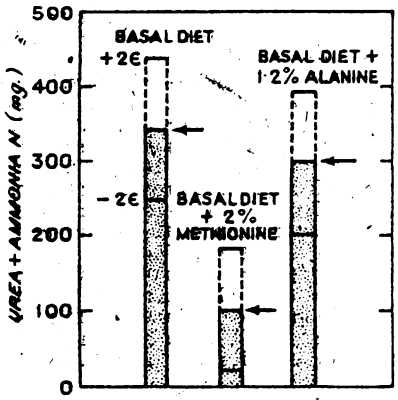

Fig. 3—Mean cumulative nitrogen loss (± 2ε) in 10 days after burning. Effect of adding methionine and alanine to the diet.

The results of four successive experiments of this type are collected in table IV. Quite clearly the 1% methionine supplement has reduced the N loss almost completely. The curative effect of the diet supplemented with the mixture of synthetic amino-acids was, however, almost negligible. Possible reasons for this are discussed below. In fig. 4 we have plotted the cumulative N losses following burning, when the rats were maintained after the burn on the basal diet, the basal diet + extra protein and these two amino-acid supplements, showing the effects of these different diets on the N loss. It seems clear that only the 1% methionine diet reduced the N loss in a similar way to the raised-protein diet.

Estimations upon fæces.—Values of the mean fæcal N excretion for the preliminary period and that following the burn are given in table V for rats upon basal diet,

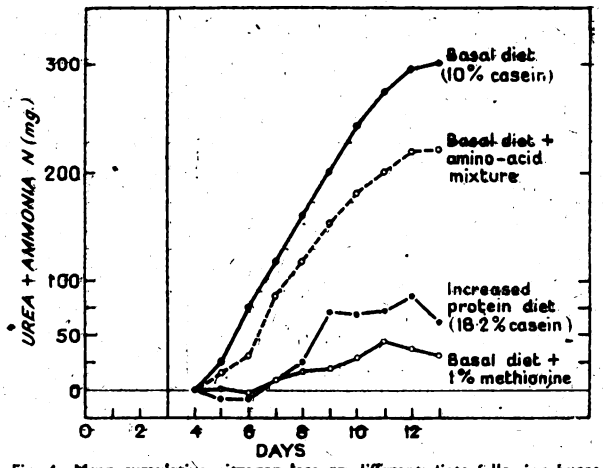

Fig. 4—Mean cumulative nitrogen loss on different diets following burns at 73° C for 30 sec.

and on the 1% methionine and the amino-acid mixture supplements. It will be seen that there is no difference between the groups; hence, the benefit from the methionine is not due to "diversion" of N from urine to the fæces in the burned animals.

Experiments with cysteine.—In view of the positive effect of the methionine supplement some curative experiments were done in a similar way with 1% cysteine; six pairs using 1% *dl*-cysteine (synthetic) and six pairs using 1% *l*-cysteine (as ester hydrochloride). Of these, three of the latter six burned animals died within 48 hours of the burn. The averaged results for the remaining nine pairs of animals are given in table VI. They show that cysteine had no beneficial effect on the N loss.

TABLE IV—CURATIVE EXPERIMENTS

Effects of 1% methionine (A), and an amino-acid mixture (B) on the nitrogen excretion of rats following burns at 73° C for 30 sec. (C) Mean body-weights of these groups of animals.

A.—*Daily urinary urea and ammonia nitrogen excretion (mg. N per 21 hrs.); rats on the basal diet for days 0–3 inclusive, and then both control and burned animals placed on a diet supplemented by 1% methionine, from day 4 onwards*

Rat	Days 0	1	2	3	4	5	6	7	8	9	10	11	12	13
Control animals														
CU	110	119	118	128	122	145	133	146	146	167	131	162	162	153
CY	76	80	91	92	96	88	104	89	107	93	82	151	143	137
CX	103	109	111	120	117	112	128	137	147	141	143	158	155	143
CZ	117	118	144	157	112	191	180	133	146	103	155	117	115	152
*DL	133	137	151	115	130	139	177	129	198	158	191	157	163	177
*DH	138	162	149	154	103	137	150	169	191	159	169	165	174	170
*DS	128	141	158	139	137	150	191	177	172	154	178	160	163	169
*DZ	156	151	160	132	164	175	187	163	166	163	151	105	156	140
ED	164	158	152	133	172	151	156	159	136	176	141	123	178	164
EF	132	137	123	158	125	178	181	168	166	166	191	196	187	210
EP	138	139	138	150	152	164	152	148	148	150	136	145	137	138
EQ	127	141	149	127	164	138	148	125	174	143	145	127	148	155
Mean	127	133	137	134	133	147	157	145	160	148	150	147	157	159
Animals burned on day 3 at 73° C for 30 sec.														
CW	115	131	131	123	172	142	140	147	148	145	150	179	136	168
CV	93	102	99	95	133	104	115	131	136	155	144	155	141	141
CT	95	104	110	117	147	144	125	180	180	177	174	163	203	172
DA	143	115	126	146	149	193	158	156	180	149	131	155	139	151
*DO	123	126	137	106	139	126	174	167	192	179	189	185	154	180
*DK	149	129	159	105	129	118	121	62	153	131	164	138	125	130
*DY	155	150	140	132	170	172	196	188	182	183	168	227	145	213
*EC	154	142	145	144	180	164	172	161	185	173	211	161	199	194
EH	120	84	124	109	123	136	142	156	152	163	157	132	149	140
EI	131	136	139	160	161	114	186	195	187	158	154	157	153	144
EW	137	102	115	122	179	176	133	191	190	170	161	156	140	151
EZ	144	149	164	156	221	186	165	152	135	123	140	146	122	98
Mean	130	123	133	126	159	148	152	157	168	150	160	163	150	152

* 20 g. food per diem.
DS, DZ, and DY males; all the rest females.

B.—*Daily urinary nitrogen excretion of rats (control and burned animals) in the curative experiment with the amino-acid mixture. Details of technique as for the methionine experiment*

Rat	Days 0	1	2	3	4	5	6	7	8	9	10	11	12	13
Control animals														
*DM	137	108	114	127	104	120	146	150	145	146	171	160	160	148
*DP	139	128	131	97	126	149	168	173	208	200	209	205	185	170
*DT	110	127	109	108	128	147	169	173	178	178	166	174	103	166
*DV	150	132	115	121	135	141	162	170	157	157	165	174	167	169
EJ	149	155	143	145	137	167	157	157	161	160	144	142	169	163
EL	131	138	141	128	131	143	147	154	172	144	135	115	146	166
ET	135	151	148	133	127	132	132	139	138	119	164	122	146	136
EX	173	155	137	128	118	135	147	120	134	115	162	161	123	144
Mean	141	137	130	123	126	142	156	154	162	152	165	157	150	158
Burned animals														
*DN	154	132	150	140	146	120	190	195	229	204	197	199	153	137
*DQ	143	161	155	130	151	124	198	233	198	196	206	165	141	126
*DW	94	99	135	121	113	192	185	205	201	178	211	232	196	201
*EA	157	110	95	140	123	188	192	181	191	207	178	163	141	126
EK	124	148	143	132	151	158	159	214	221	219	204	137	221	207
EM	135	129	130	126	152	148	166	211	176	165	169	147	175	183
FA	116	110	117	123	203	174	145	184	152	138	175	157	147	137
Mean	132	127	132	130	148	158	176	203	195	187	191	177	169	160

* 20 g. food per diem.
DM, DN, DP, DQ, DT, DV, and DW males; all the rest females.

C.—*Mean body-weights of groups of rats shown under A and B*

Rat	Days 0	1	2	3	4	5	6	7	8	9	10	11	12	13
A.—Methionine experiment														
Control	149	149	150	149	149	149	148	148	148	148	148	148	150	142
Burned	147	148	148	148	155	157	154	151	149	146	145	145	144	149
B.—Amino-acid experiment														
Control	127	128	129	129	130	130	130	131	131	132	133	133	135	136
Burned	130	131	131	131	137	140	139	136	134	134	134	134	132	131

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In view of the abnormally large amounts of methionine being given to the rats, it was thought that an appreciable fraction of this amino-acid might escape fixation,

TABLE V—MEAN DAILY FÆCAL N (MG. PER 21 HRS.) OF RATS ON VARIOUS DIETS

Mean daily fæcal N of rats during preliminary 4-day period (22 rats)	65 ±5·0 (±2e)

Mean daily fæcal N in the 9-day period (days 5–13)

—	Controls (±2e)	Burned (±2e)
Basal diet	58 ± 9·3 (4 rats)	65 ±22·0 (2)
1% methionine	56 ± 6·9 (4)	63 ± 9·7 (4)
Amino-acid mixture	72 ±18·7 (4)	59 ±10·0 (4)
Mean	62 ± 7·9 (12)	62 ± 6·3 (10)

and be eliminated by the kidneys. In a series of six urinary estimations from rats upon both 1% and 2% methionine diets, there was not a measurable amount of methionine in the urine; it was estimated that less than 4 mg. per diem was excreted as such—i.e., not 4% of the methionine ingested. Similarly, on the cysteine supplement less than 2% of the cysteine was excreted in -S-S- form as judged by qualitative test.

TABLE VI—EFFECT OF 1% CYSTEINE SUPPLEMENT ON THE N LOSS FOLLOWING BURNS AT 73° C FOR 30 SEC.

Controls					Burned				
Rat	Basal N excretion in 4 days (mg. N)	Excretion in 9 days at basal rate	Excretion in days 5–13	Increase	Rat	Basal N excretion in 4 days (mg. N)	Excretion in 9 days at basal rate	Excretion in days 5–13	Increase
*JI	530	1195	1262	167	JX	499	1124	1350	226
*JR	643	1448	1554	106	*JT	552	1242	1988	746
*JS	729	1641	1783	142	*JU	564	1269	1734	465
JW	493	1108	1203	95	*JV	660	1485	1930	445
JY	549	1259	1211	−48	JZ	539	1214	1388	174
KA	433	980	1238	258	KB	478	1078	1407	329
LB	421	946	1116	170	LC	469	1054	1420	366
LH	405	910	1073	163	LG	385	865	1282	417
LI	523	1178	1177	−1	LL	408	918	1502	584

—	Controls	Burned
Mean increase in N excretion in days 5–13 in excess of basal excretion (±2e)	117 ±62	417 ±119
Mean N loss by burned animals in days 5–13	300 ±133	

* 20 g. of food per diem.

Rats JI to KB all males and given 1% *dl*-cysteine.

Rats LB to LL all females and given 1% *l*-cysteine as ester hydrochloride.

Body-weights.—It will be seen that in both the maintenance and the curative experiments there are slight differences in the average losses in weight in the burned animals on the different diets. These are not, however, statistically significant, although they happen to correspond roughly with the extent of the N loss.

DISCUSSION

The synthetic methionine used was racemic; this is usually held to behave physiologically as the natural form (Rose 1938), though Bennett (1939) thought that the *dl*-form was "somewhat less readily used for growth than the *l*-form." The alanine was also racemic; since this is not an essential amino-acid, it is debatable whether 1·2% alanine or 0·6% is physiologically equivalent to the methionine so far as α-amino nitrogen is concerned. Since, however, 2% methionine was used in the maintenance and 1% in the curative experiments, it seems clear that the alanine does not have the beneficial action of methionine, and that the curative effect of the latter is not merely due to feeding extra α-amino N. This point is also brought out in the experiments with the amino-acid mixture, where there was a larger increase in amino N than is produced by the addition of 1% methionine, without improvement in urinary N excretion. However, there is another complication here, because the amino-acid addition contained as much methionine as could have been present in the 8% casein addition, previously shown to be effective. It is true that the remainder of the mixture was not the same. It was compounded with amino-acids available to us at the time; but we do not consider the difference due to the inclusion of unnatural isomers, as Kinsey and Grant (1944) and Madden et al. (1944) have recently stated that these are not antagonistic to the natural isomers in rat nutrition. Our present provisional interpretation is that absorption of the free amino-acids themselves is much more rapid than of the amino-acids as gradually liberated in the gut by digestion from a protein; and that, in the rapid absorption of the mixture, the methionine escapes fixation. The normal behaviour of the control animals upon the amino-acid mixture excludes the possibility that small impurities in one of the synthetic amino-acids inhibits the action of the methionine.

Clearly more investigation is needed, but the facts at present show that methionine is the most effective amino-acid in relieving the N loss.

Protein hydrolysates and mixtures of individual amino-acids have been used recently to replace proteins for the maintenance of N equilibrium in dogs and also in human patients (Bassett et al. 1944); for review see Gaunt (1944). In the absence of tryptophane, lysine or methionine protein hydrolysates were ineffective (Elman 1939, Holt et al. 1941, Albanese et al. 1941, 1943). Earlier Cuthbertson (1936) was unable to reduce N losses in the urine in patients with fractures by supplements of cystine or glycine; he thought this might have been due to lack of protein in the rest of the diet. In a memorandum to the War Wounds Committee, which only recently came to our notice, Cuthbertson (1942b) suggested the importance of giving proteins rich in sulphur-containing amino-acids in burns to replace skin losses of these amino-acids.

These experiments show that the burn produces a nutritional deficiency which simulates a toxæmia; it is therefore another example of a deficiency imitating toxæmia, with the added important point that the extra call for the food factor is due to pathological strain. Here the experimental demonstration that one amino-acid can replace the extra protein supports directly the hypothesis that the N loss is due to the raiding of tissue-protein molecules for methionine; the failure of alanine shows that $-NH_2$ N is not enough. But the simple idea that methionine is needed to replace the sulphur lost in the skin is not consistent with the failure of cysteine. This leads us to the view that methionine is here exerting its other well-known function—that of methylation—the evidence for which has been well summarised by du Vigneaud (1942). So far we have no indication that the livers of these animals at this stage are not functioning properly (Clark and Rossiter 1944); in fact much of the previously reported damage to the liver in burns is to be explained as due to the use of tannic acid (Wilson 1942, Cameron et al. 1944). See also Wells et al. 1942, Erb et al. 1943, Cameron et al. 1943, Barnes and Rossiter 1943, Hartman and Romence 1943.

Meanwhile, as a practical outcome, since methionine can be given in fluid form at a time when a patient would be unable to take protein as such, these experiments justify a clinical trial.

Summary

1. Metabolic experiments on burned rats show that increase in the dietary protein substantially reduces the tissue wasting (with its accompanying loss of nitrogen in the urine) seen when the animal is maintained on diets of low or moderate protein value. This underlines the importance of high protein intake for patients suffering from burns, and suggests its value in other conditions where large areas of skin are lost.

2. The urinary losses in nitrogen after burning were reduced substantially by the inclusion of 1% methionine in the diet. Neither alanine, nor a mixture of synthetic amino-acids, nor cysteine, had a similar effect. It is suggested that the apparent toxæmia is in reality a deficiency, induced by a call for one amino-acid with consequent raiding of a whole protein molecule.

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3. During the period when patients suffering from burns cannot ingest much protein, methionine should be tried in the hope of stopping the nitrogen loss and consequent tissue wasting.

One of us (P. B. C.) is indebted to the Medical Research Council for a personal grant; both the Medical Research Council and the Nuffield Committee (Oxford) have contributed towards the cost of the investigation. We are much indebted to the Ministry of Supply for synthetic amino-acids, especially methionine, which made the research possible, and to Mr. Stocken, D PHIL., for cysteine ester. Thanks are also due to Major R. J. Rossiter, RAMC, for help in the early stages, and to him, to Dr. D. P. Cuthbertson, and Mr. C. W. Carter for helpful criticism. This work has been carried out under the ægis of the Burns Subcommittee of the War Wounds Committee of the Medical Research Council.

Appendix I

CREATINE EXCRETION AND LEVEL OF PROTEIN INTAKE

Clark et al. (1944) found that following a severe burn (75° C for 30 sec.) rats showed a sharp rise in creatine excretion in the 2 days after the burn. There was also a slight but constant fall in creatinine excretion in the 24 hours after the burn. The latter effect was thought to be due to the impaired kidney function resulting from the hæmoconcentration.

In our preliminary experiments, in which the rats were burned at 75° C, some observations were made upon the creatine and creatinine excretion after burning, when the rats were maintained on different levels of protein intake. The number of rats observed is necessarily few since, as mentioned previously, the temperature of burning was subsequently reduced to 73° C. However, the observations made confirmed the results of Clark et al., and also indicated that although an increased protein intake reduces the loss of N as urea and ammonia, the sharply defined creatinuria caused by a burn was unaffected by the protein level of the diet.

Table VII shows the mean excretion of creatine N for the day before, and the 3 days after, a burn at 75° C for 30 sec., for groups of rats maintained on various levels of protein intake.

It will be seen that neither the duration nor the extent of the creatinuria is affected by changes in the protein content of the diet.

Appendix II

STATISTICAL NOTE

Protein.—The sum of the nitrogen excretions for days 5–11 and days 5–13 inclusive was calculated for each rat.

TABLE VII

Protein intake	Day before burning	Days after		
		1	2	3
4·5 % (3 rats) ..	0·4	5·3	2·4	0·8
14·5 % (5 rats)* ..	0·6	5·8	3·6	1·8
22·5 % (3 rats) ..	0·6	5·7	2·6	1·3

* Including three values from the report of Clark et al.

From these collected values the standard error of the mean (ε) was determined by the usual method.

The standard error for the difference of the means for the burned and control animals, on each of the experimental diets, and also the P values for the differences, were calculated using Fisher's formula. In calculating these differences for the raised-protein diets, we have included the control animal CD, which behaved very abnormally (see table II). If this and its burned fellow are excluded, the total mean difference between "burned" and "control" is reduced from 71 to 25 mg. N. Similarly a corrected fig. 1 no longer shows any appreciable separation of the curves on days 5–7.

Amino-acid supplements.—In the maintenance experiments the cumulative nitrogen loss in 10 days after burning was calculated for each rat, by reference to the mean N excretion of that rat during the preliminary 4-day period. From these values the mean cumulative loss for each group of rats was determined, together with the standard error of the mean (ε). These figures are shown in table VIII.

TABLE VIII—STATISTICAL ANALYSIS OF THE RESULTS OF THE MAINTENANCE EXPERIMENTS WITH METHIONINE AND ALANINE

Diet	Mean cumulative N loss in days 4–13 (±2ε)	t	P	Difference between mean N loss and loss on the basal diet (±2ε)	t	P
Basal ..	342 ±95	7·201	< 0·01	..	..	..
2 % Methionine	101 ±82	2·469	0·05–0·02	241 ±740	3·434	< 0·01
1·2 % Alanine	298 ±95	6·300	< 0·01	44 ±145	0·605	0·6–0·5

It will be seen that the losses on both the basal diet and on the diet supplemented by alanine are highly significant, and that the loss on the methionine-supplemented diet is less significant. Further, comparison of the losses on the two supplemented diets with the loss on the basal mixture, shows that the apparently beneficial effect of the methionine is highly significant, while the alanine has no significant effect whatever. Similarly when plotted graphically it is seen that the lower limit for the losses on the basal diet and the alanine-supplemented diet (i.e., the mean loss −2ε) still exceeds the upper limit (i.e., the mean loss +2ε) for the loss with the methionine supplement.

TABLE IX—CURATIVE EXPERIMENTS

Mean cumulative N loss	Control (±2ε)	Burned (±2ε)	Difference (±2ε)	P
Basal diet:				
Days 5–11 ..	972 ± 56	1247 ± 66	275 ± 86	< 0·01
Days 5–13 ..	1272 ± 66	1573 ± 84	301 ±107	< 0·01
Extra protein:				
Days 5–11 ..	1410 ± 80	1481 ±139	71 ±160	0·4–0·3
Days 5–13 ..	1825 ± 79	1886 ±175	61 ±192	0·6–0·5
1 % Methionine:				
Days 5–11 ..	1054 ± 78	1107 ± 74	53 ±107	0·4–0·3
Days 5–13 ..	1368 ± 94	1410 ± 95	42 ±184	0·6–0·5
Amino-acid mixture:				
Days 5–11 ..	1084 ± 85	1283 ± 72	199 ±114	< 0·01
Days 5–13 ..	1394 ±100	1612 ± 98	218 ±141	< 0·01
1 % Cysteine*:				
Days 5–13 ..	..	..	300 ±133	< 0·01

* On the cysteine supplement, the standard error of the mean N loss was calculated as in the maintenance experiments, owing to the variations in basal excretion caused by different levels of food intake in 3 out of 9 rats (table VI).

In the curative experiments the standard errors of the mean losses on the methionine and the amino-acid mixture supplements were calculated as in testing the statistical significance of the benefit from increased protein intake. For comparison, the values for the experiments on the basal diet, the increased protein, and the two amino-acid supplements are all given in table IX.

REFERENCES

Albanese, A. A., Holt, L. E., Brumback, J. E., Hayes, M., Kajdi, C., Wangerin, D. M. (1941) *Proc. Soc. exp. Biol., NY*, **48**, 728.
— — — Kajdi, C. N., Frankston, J. E., Wangerin, D. M. (1943) *Ibid*, **52**, 18.
Anderson, A. B., Semeonoff, E. (1944) *Spec. Rep. Ser. med. Res. Coun., Lond.* No. 249; L. Colebrook.
Barnes, J. M., Rossiter, R. J. (1943) *Lancet*, ii, 218.
Bassett, S. H., Woods, R. R., Shull, F. W., Madden, S. C. (1944) *New Engl. J. Med.* **230**, 106.
Bennett, M. A. (1939) *Biochem. J.* **33**, 885.
Black, D. A. K. (1941) Personal communication.
Cameron, G. R., Milton, M., Allen, J. W. (1943) *Lancet*, ii, 179.
Cameron, G. R., et al. (1944) unpublished report to Medical Research Council; *J. Path. Bact.* In press.
Clark, E. J., Peters, R. A., Rossiter, R. J. (1943) Report to Medical Research Council; (1944) *Quart. J. exp. Physiol.* In press.
— Rossiter, R. J. (1944) *Ibid*, **32**, 279.
Conway, E. J., O'Malley, E. (1942) *Biochem. J.* **36**, 655.
Co Tui, Wright, A. M., Mulholland, J. H., Barcham, I., Breed, E. S. (1944) *Ann. Surg.* **119**, 815.

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UTERINE GRAFT OPERATION FOR GENITAL PROLAPSE

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THIS operation was designed primarily for genital prolapse complicated by some condition of the uterus, other than carcinoma, suggesting the advisability of hysterectomy. These complicating conditions were generally either moderate enlargement due to small fibroids or to fibrosis, or uterine hæmorrhage. Such cases may be dealt with by vaginal hysterectomy and suture of the transverse ligaments, but the late results of this combined operation are not always satisfactory, and if prolapse of the vaginal walls should recur a second operation is particularly difficult.

During the first year in which I practised the operation I kept to these limited indications and consequently used the method in only a few cases. It proved so satisfactory, however, that I have since employed it more generally, especially in cases in which cystocele is the chief factor and in which stress incontinence exists. Cure of such incontinence by direct suture of the muscle tissue which should support the urethra is often difficult, the tissue being often very fragile, and the results are sometimes unsatisfactory, especially in the obese. In the technique to be described control is restored without any suturing of this layer of muscle.

THE OPERATION

The operation is a modification of the valuable interposition operation originally described by Wertheim; indeed so small a modification that it may well have been practised occasionally by surgeons who have not thought it worthy of special description. But from experience in some 40 cases I believe that it is a useful modification.

Its particular feature is the use of a strip of the posterior wall of the uterus to form a living musculo-peritoneal graft interposed between the bladder and the anterior vaginal wall. The purpose of the graft is to reinforce the anterior wall, to ensure which the raw surfaces of the graft and the vaginal wall are closely approximated by sutures. The graft is, however, so fashioned as to fulfil another function—namely, to fit into the subpubic angle in such a way as to support the dislocated urethra in cases of stress incontinence.

A bladder sound is passed to ascertain the degree of dislocation of the urethra from its normal subpubic attachments and to define the lower limits of the bladder on the cervix. The amount of vaginal wall that should be removed is estimated and a decision reached as to whether the vaginal portion of the cervix should be removed. Generally, I think, it is advisable to remove it along with the resected portion of the body of the uterus.

The cervix is drawn down and a transverse incision is made just below the edge of the bladder as defined by the sound. The vaginal wall is then separated from the bladder by sliding blunt-pointed scissors along the line of cleavage between the vaginal wall and the bladder as far as the base of the urethra. The vaginal wall is incised vertically and separated for an appropriate distance from the bladder; there is no need to define the layer of pelvic fascia by separating it from the vaginal wall. The bladder is then separated from the uterus by blunt dissection, aided by a few touches with the knife, and the vesico-uterine pouch of peritoneum is opened, the anterior edge of the cut peritoneum being caught by forceps for identification later. The body of the uterus, often somewhat enlarged, is delivered through the opening in the peritoneum.

The next step is resection of the whole of the anterior part of the uterus, including the cavity. The uterine attachments of the round ligaments, tubes, and ovarian ligaments are left intact, and it is usually possible to complete the resection without dividing the uterine arteries, though, if they are very tortuous, they may have to be divided. This may be done without affecting the nutrition of the strip, which is maintained by branches of the ovarian arteries. In order to make sure that the strip is not being cut too thin, especially in the lower segment, a finger of the left hand is held along the posterior surface of the uterus while the resection is performed with the right. Below the level of the attachments of the transverse ligament the incision is deepened and the vaginal portion of the cervix removed. Vaginal hysterectomy has thus been performed—total as regards the mucous lining, subtotal as regards the posterior wall. The remaining part of the lower segment retains its attachments to the transverse ligament.

The strip or graft is now sutured into position. The anterior edge of the utero-vesical peritoneum is sutured to the upper surface of the graft, and two sutures of strong chromicised catgut, one on each side, are passed through the upper aspect of the graft close to the fundal extremity and then through the tissues as close as possible to the periosteum of the subpubic angle on each side of the urethra. A short and strong curved needle is used and care is taken that the needle does not pass right through the vaginal wall. Reinforcing sutures of thinner catgut may be used. The appropriate amount of anterior vaginal wall is now excised and the graft is fastened to the vaginal wall by anchoring sutures and by including the tissues of the graft in the suture which approximates the vaginal edges. Hæmorrhage from the raw surface of the graft has not proved troublesome; generally the anchoring sutures are enough to secure hæmostasis.

Plastic repair of the posterior vaginal wall completes the operation. It is seldom wise to omit this even where the indication is not obvious. A self-retaining catheter is left in for two or three days.

In some respects the operation is easier to perform than the usual plastic repair associated with amputation of the cervix and direct repair of the periurethral muscle. It avoids suture of the vaginal wall to the cervical mucous membrane, and, except in one case, restoration of the urethra to its normal position has cured incontinence. It is rather easier, and perhaps safer, than vaginal hysterectomy.

The method is not suited to all cases of prolapse. Obviously it cannot be used during the childbearing years, nor is it practicable where the uterus is atrophic; in such a case the graft would probably be too small to be of any use. It is chiefly called for where the uterus is bulky but not too large to be delivered into the vagina, where there is a large cystocele and stress incontinence, and especially where the endometrium is unhealthy.

RESULTS

The operation has been used in 40 cases in the last five years and the patients have been kept under observation. It has been found that the anterior wall remains strong and resists straining. Two cases have not been entirely satisfactory. In one complete continence has not been restored—a failure which I attribute to inadequate suturing of the graft in the subpubic angle. The second case illustrates the necessity of doing a repair of the posterior wall. In this case there was no rectocele and no posterior repair was done. A few months afterwards there was an incipient rectocele.

DR. CROFT, PROF. PETERS: REFERENCES (*continued*)

Cuthbertson, D. P. (1936) *Brit. J. Surg.* **23**, 505; (1942a) *Lancet*, i, 433; (1942b) Memorandum to MRC War Wounds Committee.
— McGirr, J. L., Robertson, J. S. M. (1939) *Quart. J. exp. Physiol.* **29**, 13.
du Vigneaud, V. (1942) *Harvey Lect.* **38**, 39.
Elman, R. (1939) *Proc. Soc. exp. Biol., NY*, **40**, 484.
Erb, I. H., Morgan, E. M., Farrer, A. W. (1943) *Ann. Surg.* **117**, 234.
Fisher, R. A. (1941) Statistical Methods for Research Workers, Edinburgh, p. 120.
Folin, O. (1913) *J. biol. Chem.* **17**, 469.
Gaunt, W. E. (1944) *Nutr. Abstr. Rev.* **13**, 501.
Hamilton, T. S. (1939) *J. Nutrit.* **17**, 565.
Hartman, F. W., Romence, H. L. (1943) *Ann. Surg.* **118**, 402.
Holt, L. E., Albanese, A. A., Brumback, J. E., Kajdi, C., Wangerin, D. M. (1941) *Proc. Soc. exp. Biol., NY*, **48**, 726.
Kinsey, V. E., Grant, W. M. (1944) *Science*, **99**, 303.
Leach, E. H., Peters, R. A., Rossiter, R. J. (1943) *Quart. J. exp. Physiol.* **32**, 67.
Lucido, J. (1940) *Ann. Surg.* **111**, 640.
McCarthy, T. E., Sullivan, M. X. (1941) *J. biol. Chem.* **141**, 871.
McCollum, E. V., Davis, M. (1915) *Ibid*, **20**, 415.
Madden, S. C., Woods, R. R., Shull, F. W., Whipple, G. H. C. (1944) *J. exp. Med.* **79**, 607.
Mitchell, H. H. (1923) *J. biol. Chem.* **58**, 873 and 905.
Osborne, T. B., Mendel, L. B., Ferry, E. L. (1919) *Ibid*, **37**, 223.
Rose, W. C. (1938) *Physiol. Rev.* **18**, 109.
Taylor, F. H. L., Levenson, S. M., Davidson, C. S., Browder, N. C., Lund, C. C. (1943) *Ann. Surg.* **118**, 215.
Wells, D. B., Humphrey, H. P., Coll, J. J. (1942) *New. Engl. J. Med.* **226**, 629.
Wilson, W. C. (1942) unpublished report to Medical Research Council and War Office.

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An opportunity to observe the fate of the graft by post-mortem examination was afforded by a third, particularly unfortunate case. This patient was re-admitted to hospital with pyrexia a month after discharge. The blood-urea, previously within normal limits, rose to 94 mg. per 100 c.cm. and she died of suppression of urine 9 weeks after operation. Autopsy showed an old-standing pyelonephritis on the left side, with a perinephric abscess, and a more recent pyelonephritis on the right side. The uterine graft was found to be healthy, well nourished, and firmly adherent to the vaginal wall, while the peritoneal surface was smooth and free from adhesions.

The advantages claimed for this modification of the interposition operation may be briefly summarised as follows: (1) The anterior vaginal wall is reinforced by a viable graft. (2) The endometrium is removed. (3) The attachments of the transverse ligaments to the uterus are preserved. (4) The urethra is held in its normal position close under the symphysis.

FATIGUE FRACTURE OF THE FIBULA

REPORT ON TWO CASES

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As Blair Hartley (1943) points out, fatigue or stress fractures, with the exception of those in the metatarsals, until recently have been little known in this country, and their incidence in Great Britain and America appears to be low. Writers from these countries rarely describe more than two cases. On the other hand, Sheller (1939) reports 590 examples from German field hospitals between 1935 and 1936, and of these over 100 are not metatarsal fractures. Probably with the mobilisation into the armed forces of large numbers of young men more cases will appear in the medical journals of the English-speaking nations.

Stress fracture occurs in the fibula 40 times less frequently than in the metatarsals and five or six times less frequently than in the tibia, and it occurs with equal incidence in the upper and lower thirds of the bone (Hartley 1943). Cases with the fracture in the lower third have been described by Jackson Burrows (1940; 2 cases), Hamilton and Finklestein (1944; a single bilateral case), Ingersoll (1943; 3 cases due to ice-skating in beginners), and Weaver and Francisco (1940; 1 case).

In the last 2 years I have treated 32 cases of fatigue fractures, comprising: metatarsals, 25 cases; upper third of tibia, 5 cases; and lower third of fibula, 2 cases. Because so few cases in the lower third of the fibula have been reported my two cases are described here.

CASE 1.—An NCO of an infantry regiment noticed pain in his left ankle after a cross-country run a fortnight before his admission to hospital. He had been participating in very strenuous infantry training for some weeks. There was a well-marked point of tenderness on the fibula about 2 in. above the tip of its malleolus. Radiologically (fig. 1) there was a faint "cloud" of callus about 2 in. above the tip of the lateral malleolus. He was treated by rest and graduated exercises. Two weeks later the callus was more obvious and there was evidence of endosteal bone formation extending across the bone. A hair-line fracture was visible on the negative when viewed with a magnifying glass. The pain and tenderness persisted but there was little disability. Three weeks later the callus was better consolidated and was forming a buttress across the fibular concavity. Six weeks later the appearances were as in fig. 2, where a cortical crack was now obvious, and the concavity was completely buttressed by thickened cortical bone. He was discharged a week later to an Army convalescent depot still with slight tenderness.

CASE 2.—An infantry soldier during training complained of pain in the left foot after an assault course and was treated for about three weeks for foot strain. At the end of this period the callus around a march fracture of the 3rd metatarsal was clinically obvious and confirmed radiologically. About this time he complained of pain in the left ankle. Clinically there was no visible abnormality but there was a very tender point on the fibula 2 in. above the tip of the lateral malleolus. Radiologically no abnormality could be seen (fig. 3). His symptoms persisted and three weeks later there was radiographic evidence of callus at the point of the fibular tenderness. This was diagnosed as a stress fracture but no fracture line could be seen. With rest and graduated exercises his symptoms subsided and a fortnight later the callus was better calcified and formed a buttress across the concavity as in case 1 (fig. 4). The endosteal bone formation across the fibula is seen again but not so clearly. He was discharged to an Army convalescent depot a week later almost symptomless.

COMMENT

These two cases show all the features described by Blair Hartley as characteristic of fatigue fractures:—

(1) Pain after exercise over one of the long or stressed bones.
(2) Callus which gradually increases in amount and steadily consolidates.
(3) An easily missed fracture line, often no more than a hair-line fissure.
(4) Radiological findings situated on the concave or "stressed" aspect of the bone.
(5) Normal appearance of the bone as a whole.
(6) Absence of any systemic disease.

The two cases are almost identical radiologically with those quoted above, though Weaver and Francisco postulate an infective theory.

Ingersoll remarks that this type of fatigue fracture 2 in. above the tip of the lateral malleolus is found at the point of maximum stress imparted to this part of the bone. It is the point where bending takes place when the foot is laterally rotated and everted, the talus forcing the fibula laterally so that, with the inferior tibiofibular ligament acting as a fulcrum, the fibula bends at its narrowest point. Ingersoll's cases occurred in young boys when ice-skating as novices, and he points out that such beginners usually skate with the push-off foot everted. An infantry soldier carrying out his training over rough ground must be continually everting and laterally rotating his foot and so must produce strain at this narrow part of the fibula.

I gratefully acknowledge the assistance in the interpretation of the radiograms of Mr. I. D. Kitchin, Dr. Blair Hartley, and Dr. R. Fawcitt.

REFERENCES

Burrows, H. J. (1940) *Brit. J. Surg.* **28**, 82.
Hamilton, A. S., Finklestein, H. E. (1944) *J. Bone Jt Surg.* **26**, 146.
Hartley, J. B. (1943) *Brit. J. Radiol.* **16**, 255.
Ingersoll, C. F. (1943) *Amer. J. Roentgenol.* **50**, 469.
Sheller, F. (1939) *Med. Welt*, **13**, 1333.
Weaver, J. B. Francisco, C. B. (1940) *J. Bone Jt Surg.* **22**, 610.

1 2 3 4

Fig. 1—Case 1. Two weeks after onset of tenderness, showing callus 2 in. above tip of malleolus.
Fig. 2—Case 1. Six weeks later, showing cortical crack and buttressing of thickened cortical bone.
Fig. 3—Case 2. At onset of pain in ankle, showing no abnormality.
Fig. 4—Case 2. Five weeks later, showing callus and buttressing by thickened cortical bone.

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Reviews of Books

Social Aspects of Tuberculosis

S. ROODHOUSE GLOYNE, MD LEEDS, DPH, pathologist, London Chest Hospital. (Faber. Pp. 148. 8s. 6d.)

As welfare work gains in importance the need for serious and well-written textbooks grows; and Dr. Gloyne has here set out much information which will be of value to social workers. Indeed, the book is perhaps less a study of special aspects of tuberculosis than a handbook on relevant aspects of the disease for health visitors and almoners. It avoids, however, the excessive simplification with which lay readers are so often insulted. More might have been said, perhaps, about the Government scheme of maintenance allowances and the possible rôle of tuberculosis almoners; and a greater share of space might have gone to mass radiography, which will certainly present problems for the social worker. This method will lead to the discovery of increasing numbers of early cases, and many of these patients will need guidance on returning to full-time or part-time work. The importance of village settlements and day workshops in reablement is not overlooked, but these are available for relatively few patients. Dr. Gloyne might well have mentioned the need for close coöperation between social workers and the local labour exchanges which must help to find suitable jobs for patients. It is perhaps worth noting that it is now generally held that the Mantoux test should not be considered positive when only erythema is present; and that a control injection is not necessary. Such criticisms hardly detract from the value of the best single book on tuberculosis so far produced for students of social medicine.

Operations of General Surgery

THOMAS G. ORR, MD, professor of surgery, University of Kansas. (Saunders. Pp. 723. 60s.)

IN 700 pages the author has described almost every operation a general surgeon might be called upon to perform. The book is illustrated by a large number of good pictures, in the belief that these can be "many times more instructive than the descriptive text." Indeed, the text has been made "as brief as is consistent with step-by-step description of each operation." This plan has proved quite successful, though the reader may sometimes wish for more detail. Compare for instance the account of the approach to the cervical sympathetic from behind, here, with the precise anatomical directions given by A. K. Henry. Or, again, how is the reduction of a fracture of the neck of the femur brought about? Or how is the bladder freed in a second-stage prostatectomy? But such small omissions are only important because the book is intended for the beginner in surgery. They are outweighed by many merits. Rare operations are described so that any experienced surgeon could carry them out, and wherever the book is opened there is good entertainment for the practising surgeon.

Emergency Treatment of the Injured and Sick at Sea

J. WILSON REID, MD LPOOL, hon. medical officer, HMS *Conway*. (Charles Birchall. Pp. 105. 2s.)

THIS little book embodies an experiment. Justified only by the isolation of a ship at sea, the author quietly and carefully lifts the veil from the conclusion of first-aid treatment and allows the layman, in exceptional circumstances, to become a doctor. Every precaution is taken to guide his actions, and the lucid easy style makes it almost impossible to misunderstand the instructions. The contents, by a remarkable piece of compression, contain in 94 small pages the whole range of first-aid technique, and also, italicised, details of the type of treatment which would probably be given by a young house-surgeon, were he available.

There are few points for criticism. Many surgeons would disagree with the giving of sweetened drinks in the expectant treatment of acute appendicitis; and the external and internal application of sulphonamides in severe burns without reference to their extent is likely to lead to trouble. A small note of the technique and dangers of sulphonamide therapy would justify the space, and at the time of writing sulphathiazole seems a better drug than sulphanilamide for prophylaxis and treatment.

A chapter on emergency nursing is welcome, and the admirable section on transport of casualties is illustrated by simple but ingenious diagrams. An odd omission is the method of lowering a stretcher into a small boat with a derrick and four cleats, probably the easiest and safest way when the ship's own boat is not available, but this may only mean that it was thought too obvious to require description. There is a good paragraph on Eve's method of artificial respiration by the rocking stretcher, and an appendix on lifeboat ailments which should be useful to those who have to make long journeys in these uncomfortable craft. By way of contrast there is a section on hygiene in the tropics.

Altogether Dr. Reid has produced an unusual and interesting book. A note of caution pervades it, and used intelligently it should prove a standby to unhappy stewards and anxious mates thrown on their own resources amid the perils of the sea. More important, it will give confidence and save lives.

For Childless Wives

By a Doctor. (Published for Family Planning Association by H. K. Lewis. Pp. 16. 2s.)

HOSPITAL outpatient departments, clinics, general practitioners, and specialists will find this well-written pamphlet useful, not only to hand to patients who ask help on account of sterility, but to give to those who are hesitating as to whether to seek advice. It explains what the investigation and treatment of a sterile marriage entails and what hopes there are of success. In the simplest terms it outlines modern methods and ideas, and suggests where and how advice should be sought.

Medical Societies

TUBERCULOSIS ASSOCIATION

AT a meeting in London on Nov. 17 last, with Mr. J. E. H. ROBERTS, the president, in the chair, a discussion on

Work as a Therapeutic Measure in Tuberculosis

was opened by Dr. F. R. G. HEAF, whose paper appears at the front of this issue.

Dr. PETER EDWARDS thought that, in the treatment of tuberculosis, there was a proper time for every measure. An appropriate period of rest should be followed by graduated exercises, and later by work. A sanatorium regime was essential. There was a psychological danger in long-continued rest, and idleness was a calamity. On the other hand, work should not render the patient breathless or cause any systemic reaction. Even when patients had attained the stage of work, they should rest whenever possible.

Dr. W. L. YELL analysed Marcus Paterson's theory of auto-inoculation. He considered that excessive reaction should be treated by absolute rest. The profit motive was the best incentive to work.

Dr. J. H. CRAWFORD described the methods used at Preston Hall. He regarded industrial rehabilitation as a necessary supplement to sanatorium treatment, and felt that work, when the patient was ready for it, was an essential part of treatment. Brieger's work at Papworth promised to be very valuable in the ascertainment of a patient's capacity for work. At Preston Hall patients were carefully observed at work. About 8% of them eventually became settlers, but they had to be medically, industrially, and temperamentally suitable. The prognosis of patients working in a village settlement was better than that of similar patients working under unsheltered conditions. He agreed that it was very desirable to employ ex-patients in sanatoria. It was not necessary that outdoor work should be provided.

In the subsequent discussion it was pointed out that handicrafts should not be started too early for patients who are in bed. The general feeling was that the value of work in the treatment of the tuberculous *lesion* had never been proved, but that there was no doubt of its usefulness in the gradual rehabilitation of the patient. Rest, general and local, was of primary importance in healing the disease, but prolonged rest was detrimental to the patient's general welfare.

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THE LANCET

LONDON: SATURDAY, MARCH 3, 1945

Our Tuberculosis Service

FEW ventures have been launched with better intentions or higher hopes than the tuberculosis service of Great Britain. The Astor report of 1912 defined the problem, and the Public Health (Tuberculosis) Act of 1921 provided means for dealing with it. The aim was, and is still, to prevent a preventable disease, and to care as thoroughly—and hence as economically—as possible for those who have acquired it. In so far as the service has failed, or has had only sporadic and moderate success, we must blame our lack of thoroughness. In a report on reorganisation the Joint Tuberculosis Council[1] give as the first of six faults in the service the fact that it is administered by 188 scheme-making authorities in Great Britain and Northern Ireland; that each of these construes in its own way the words "make adequate arrangements." Central advice about the standard to be attained is lacking. This state of things has been satirised by one of our peripatetic correspondents.[2] A patient living under the ægis of a wealthy well-organised county can get first-class care in a modern sanatorium, or a substantial subsidy towards his maintenance in a sanatorium outside the county. A patient living, perhaps, across the street but coming under a poor borough council will get casual and inadequate treatment in an old-fashioned ill-equipped place where modern methods of treatment are rarely attempted. Or a patient living on the fringes of a county borough may have to undertake tedious journeys to get treatment which is available half a mile away; and at present transport difficulties add to his fatigues. The small poor authorities have a remedy for these deficiencies in their power to combine with other authorities to provide joint schemes. This has been done successfully in three cases: the Staffordshire, Wolverhampton, and Dudley Joint Board; the Gloucester and Gloucestershire Joint Board; and the Warwickshire and Coventry Joint Committee. The smaller authorities in these combinations benefit greatly by the increased facilities thus made accessible to them, and patients in the area covered can count on uniform standards of care. Why these good examples have not been widely followed is not clear, though narrow local patriotism must be partly to blame. The Ministry of Health has no power to compel small authorities to combine.

Waiting-lists are now the rule at sanatoriums, despite the fact—as the JTC committee point out—that tuberculosis is "widely advertised as requiring early diagnosis and treatment." It is the task of the sanatorium to bring the patient to the point at which, with proper home management, his disease will heal, and to teach him the principles by which he must govern his life so as to recover full health. More often than not, however, he is prevented from putting these principles into practice by the conditions under which he must live on discharge. Poverty and overcrowding favour the infection: and it is to poor and overcrowded homes that most patients must return. Fresh air and rest are instantly beyond their reach. Under the Ministry of Health order which came into force in 1943, the patient with pulmonary tuberculosis, provided he is likely to recover, is now entitled to money allowances sufficient to relieve him of serious anxiety.

> A man and wife, one of whom is dependent on the other, may receive £1 19*s.*; for a dependent child over 16 a further 12*s.* is paid, and smaller allowances, according to age, for younger children. In addition, a rent allowance up to 15*s.* a week, and a fuel allowance of 3*s.* 6*d.* a week for 26 weeks may be claimed; and for patients with specially heavy commitments a further discretionary allowance up to 10*s.* a week can be granted. Something may be deducted from these allowances on account of other grants which the patient is receiving, such as sickness or disablement benefit, disability pension or treatment allowance from the Ministry of Pensions, or payment from employers. The grants start as soon as the tuberculosis officer has diagnosed a pulmonary lesion with a prospect of cure. While the patient is in sanatorium his personal allowance is reduced by 10*s.* a week, but he can claim travelling allowances for his near relatives. Housewife patients may apply for a special allowance of 10*s.* a week towards domestic help at home.

This is a real advance on the old system, under which a patient had to seek public assistance during his months of convalescence. It must be borne in mind, however, that the grants are paid only to those patients with pulmonary tuberculosis who are believed to have a chance of recovering. Those deemed to be beyond hope of cure must apply for public assistance—an unpopular source of supply, because public-assistance committees are not always sensitive to the patient's needs or pride.

But even a recovering patient needs more than financial security to put him on his feet again—he needs the prospect of work and the assurance that he will be fit to do it. The committee note that no area in the country has an adequate scheme for the rehabilitation of patients leaving sanatoriums; and this is probably the most serious indictment of our service as it stands. We might learn from the principles applied in some cities of the Soviet Union, where tuberculous patients who are fit enough to work enjoy certain privileges: they are given suitable work, released from night-shifts, and allowed extra rations; and if it is thought necessary, they go at night to sanatoriums where they have the care of a doctor and nurse and get their rest in hygienic comfortable surroundings. The first three measures are unquestionably sound, but whatever the advantages of the last, it would probably be unpopular in this country. British patients would almost certainly hold that if they were well enough to work they were well enough to enjoy the hazards of home life, and it would be hard to convince them otherwise. A reablement programme, however, has plenty of ground to cover before the question of night sanatoriums need be raised. At present a tuberculous patient has no guarantee that he will get any work at all, let alone suitable work.

The committee believe that a revised programme of reablement should be administered by a senior tuberculosis officer, with a staff of workers trained in social investigation and with full knowledge of

1. Report of the Committee on Reorganisation of the Tuberculosis Service. Copies from the Honorary Secretary, Joint Tuberculosis Council, 1, Becket Street, Oxford.
2. *Lancet*, 1942, ii, 708.

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local agencies capable of giving help. The tuberculous family should be regarded as a unit for treatment and the service should ensure to them not only an adequate home but proper food, medical care and supervision, home-helps, and when necessary foster-homes where the children can live out of harm's way. If the patient needs training in a new type of work he must have it; an appropriate job must be waiting for him as soon as he is capable of doing it. Dr. HEAF, in his article in this issue, urges the need for a simple way of assessing the safety limit of a patient's energy output, so that the sanatorium can guide him to take up an occupation with an energy output well within safety limits. The colony and the sheltered workshop will have their place in the scheme, and all must be linked with the clinical side of the service: every patient must have access to every method used for diagnosis or treatment. These principles are the theme of a film lately prepared by the National Association for the Prevention of Tuberculosis—a documentary which explains to the general public the opportunities for cure, after-care, and reablement on which a tuberculous patient should be able to count. It shows patients being trained for new work while in sanatoriums, and discharged patients who have found suitable work and continue to do it successfully; and the incidents are well presented. But the film is perhaps a little too rosy: it shows what we would like to achieve rather than what we have achieved so far.

Our method of notification also calls for revision. At present there are no half measures for the suspect: a patient must be either notified as tuberculous or left with no warning label at all. In the case of children this is especially unsatisfactory since the label "tuberculosis," like "mental defect," is apt to impose a stigma which may last for life. Moreover, as the committee point out, the present form of notification is a statement of opinion rather than fact, and fails to differentiate between primary infection and progressive illness. They propose two forms of notification: full notification for infectious or active disease, and "intimation," or provisional notification, to cover primary infections in childhood, cases of doubtful activity, phlyctenular conjunctivitis, and erythema nodosum. The discovery by the tuberculosis officer of a primary complex or a positive tuberculin reaction in a child under five should often lead, as the committee point out, to the discovery of an adult with an unsuspected active lesion.

The report foreshadows many necessary advances, but on p. 288 a correspondent points out that as a plan for a reorganised and fully adequate service it is incomplete. For example, recommendations that institutional beds shall be numerous enough to ensure that no patient waits more than a fortnight for a bed, and that emergencies should be admitted immediately, cannot be fulfilled until we have discovered how to provide sufficient nursing and domestic staff for sanatoriums. This is tied up with the reorganisation of the nursing profession, the proper protection of staff against infection, and the provision of proper care for nurses who acquire the disease. Moreover, fresh problems will be raised as soon as mass radiography becomes a routine; and the extent of these problems can be gauged from the MRC report reviewed on p. 284. Though we are incapable of dealing properly with the patients diagnosed by current methods, we shall then be faced with much greater numbers of early or suspected cases; many of which will need sanatorium treatment, while all will need to be watched. If we are to deal with tuberculosis rationally, we must apply ourselves seriously to the task of staffing the necessary beds.

How Penicillin Works

IT would be a salutary discipline for every bacteriologist working on penicillin to re-read FLEMING's original communication on the subject.[1] FLEMING described his first observation in this way: "It was noticed that around a large colony of a contaminating mould the staphylococcus colonies became transparent and were obviously undergoing lysis." If the product of the mould to which FLEMING gave the name penicillin had merely killed the cocci or prevented their further multiplication, the colonies within the zone of influence of the mould would have been indistinguishable from those more remote. So we owe the discovery of penicillin to the lysis of bacteria which had been acted upon by it. In this original paper FLEMING referred to penicillin as a bactericidal agent and gave details of an experiment which demonstrated its lethal action on staphylococci in broth at 37° C. From this experiment he concluded that penicillin belongs to the group of slow-acting antiseptics, since staphylococci were completely killed only after an interval of 4½ hours, even in a concentration 30 to 40 times stronger than is necessary to inhibit completely the culture in broth. However, FLOREY and his colleagues,[2] as a result of in-vitro experiments, concluded that penicillin is bacteriostatic and not bactericidal, at least in concentration likely to be used therapeutically. Impressed by their findings and influenced by the mode of action of the sulphonamides, most British workers have accepted penicillin as bacteriostatic rather than bactericidal, though there has been a tendency to use non-committal terms such as antiseptic, antibiotic, antimicrobial, antibacterial, and inhibitory. For example, GARROD,[3] whose opinion on antiseptics demands the greatest respect, wrote: "Penicillin is in a true sense an antiseptic rather than a germicide: it does not kill bacteria quickly." More recently[4] he has amplified this statement by experiments in which penicillin was examined to see how far it conformed to the general laws governing the action of disinfectants. His results agree with FLEMING's original view that penicillin is to be classified among the group (which includes the amino-acridines) of slow-acting antiseptics. Thus its action was affected by changes in temperature, and in the reaction of the substrate, and by the age of the bacterial culture. In addition the curious phenomenon was noted that concentrations of penicillin of 10 to 1000 units per cubic centimetre were less actively bactericidal than a concentration of 1 unit per c.cm., a finding that may be related to impurities in the drug.

There seems to be no alternative to accepting penicillin as bactericidal. But the statement must be qualified. It has been demonstrated that penicillin is actively bactericidal in an environment in which

1. Fleming, A. *Brit J. exp. Path.* 1929, **10**, 226.
2. Florey, M. E., Florey, H. W. *Lancet*, 1943, i, 387.
3. Garrod, L. P. *Practitioner*, 1944, p. 321.
4. Garrod, L. P. *Brit med. J.* Jan. 27, 1945, p. 107.

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multiplication of bacteria occurs or is capable of occurring. In other words, unlike most other bactericides, penicillin acts best in good culture media such as broth or serum, and poorly or not at all in water or in solutions of non-nutrient salts such as sodium chloride. A further peculiarity of the action of penicillin is that, although in broth at body temperature it may kill large numbers of sensitive bacteria such as staphylococci, it does not always, even in high concentration, kill all the bacteria present. The number of survivors is small, not usually exceeding one or two per million of those originally present, but these few suffice to prevent sterilisation of the culture. Since penicillin is slowly destroyed in broth at 37° C it may, after a few days' incubation, have been reduced to less than an inhibitory concentration while survivors remain alive. These then multiply and cause turbidity of the broth. The reason for penicillin's failure to attain complete sterility in broth has had little attention. Most workers have accepted the facile explanation that the survivors are individuals with abnormally high resistance to penicillin. BIGGER [5] regards the survivors, which he terms persisters, as being insensitive to penicillin because they are dormant non-dividing forms. Whether he is correct in his suggestion that the occurrence of similar persisters in the body explains the occasional failure of penicillin therapy can only be ascertained by clinical trials.

MILLER, GREEN, and KITCHEN [6] suggest that the mode of action of penicillin may not be very different from that of sulphonamides. Both act on some bacteria while being completely ineffective on others. We do not know why one organism is sensitive and another insensitive, but obviously the difference must depend on some fundamental difference in the biological characteristics or nutritional requirements of the two types. Since not all sulphonamide-sensitive bacteria are sensitive to penicillin, and not all penicillin-sensitive bacteria are sensitive to sulphonamides, the mode of action of the two must differ in some important respect. GARDNER'S early observation [7] that bacteria in the presence of penicillin enlarge without dividing suggests that penicillin acts by preventing division, and that this in some way causes the death of the bacteria. Many other workers have confirmed GARDNER'S observation that in the presence of penicillin abnormally large forms of cocci and long forms of bacilli are found. An attractively simple theory of the mechanism of penicillin action at once suggests itself. Penicillin prevents cell division but not cell growth; the cell increases in size; it bursts. Such a mechanical theory is almost certainly too simple to be true, but it has at least one feature which fits in with observed facts. FLEMING'S attention, as we have seen, was directed to the action of penicillin by the lysis of staphylococci, and TODD [8] has lately demonstrated that all the sensitive bacteria he examined—pneumococci, hæmolytic and non-hæmolytic streptococci, staphylococci, and *Cl. welchii*—undergo lysis to a greater or less extent in broth cultures containing penicillin. He found that a culture usually becomes more turbid before lysis begins and concluded that multiplication is probably an essential preliminary to either the killing or dissolving of the cells. On the other hand, the increased turbidity may be attributable to increase in size of individual organisms without actual cell-division. His viable bacterial counts would fit in with this latter explanation. His experiments do not actually prove that bacteriolysis is due to the action of penicillin. The pneumococcus and some strains of staphylococcus are notoriously susceptible to autolysis, and the former is readily dissolved by such substances as bile-salts. While bacteriophage action appears improbable under the experimental conditions, it cannot be entirely excluded. Or again lysis may be due not to penicillin but to some impurity in the preparation used. However, the most feasible explanation is that penicillin kills bacteria with a minimum of alteration to the bacterial protoplasm, so that autolysis takes place more readily than it does in bacteria killed by the action of heat or of other bactericides.

There is need for further work on the lysis of bacteria treated with penicillin, and the purest penicillin available should be used for the experiments. GARROD [9] has called attention to the different behaviour of different batches of penicillin and to the advantage of using almost pure penicillin rather than preparations of which 80–90% is impurity. Lysis should also be studied as an individual rather than a mass phenomenon. This would require a microscope fitted with a warm stage and an observer with almost unlimited patience, but the results should justify his trouble.

Control of Liver Extracts

THE liver treatment of pernicious anæmia stands as one of the most striking triumphs of therapeutics. It is so successful and so easily applied that a tendency has arisen to take it for granted, in spite of the fact that the exact nature of the curative factors involved is still unknown and that the best method of preparing liver extracts and their optimal dosage have yet to be decided. Oral treatment requires far larger quantities than are effective by injection, and for this reason the manufacture of liver extracts for oral use has until lately been forbidden, to conserve the raw material. At present, therefore, the problems of treatment centre almost entirely on the parenteral route.

It is difficult to bring home to some doctors that the peculiar antianæmic value of liver is confined to pernicious anæmia, and that this is an entity which can be definitely diagnosed with the aid of laboratory methods. At the annual meeting of the Association of Clinical Pathologists [10] Dr. S. C. DYKE laid down as the criteria of diagnosis a megalocytic anæmia, associated with gastric achlorhydria, and responsive (both by reticulocyte crisis and rise in the red cells) to suitable doses of liver or active liver extract. The reticulocyte and red-cell responses can be foretold with great accuracy by means of DELLA VIDA'S [11] modifications of the formulas of MINOT and of RIDDLE. This definition of pernicious anæmia makes its diagnosis depend on the response to the liver principle, but the only means yet available of assaying liver preparations is by the response they produce in the

5. Bigger, J. W. *Lancet*, 1944, ii, 497. *Irish J. med. Sci.* 1944, 553, 585.
6. Miller, W. S., Green, C. A., Kitchen, A. H. *Nature, Lond.* Feb. 17, 1945, p. 155.
7. Gardner, A. D. *Ibid*, 1940, 146, 837.
8. Todd, E. W. *Lancet*, Jan. 20, 1945, p. 74.
9. Garrod, L. P. *Ibid*, 1944, ii, 673.
10. See *Lancet*, Feb. 10, 1945, p. 188.
11. Della Vida, B. L. *Lancet*, 1942, ii, 275.

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blood in pernicious anæmia. It is evident that the failure of a given extract to produce a response in a case of anæmia, apparently of pernicious type, may be due either to impotency of the extract or to irresponsiveness of the anæmia. For this reason those engaged in the assay of liver extracts must have available an extract of ascertained potency as standard.

No extract unproved by clinical test should be accepted as suitable for therapeutic use. It is common knowledge that commercial preparations of liver vary widely in potency and that some indeed are almost inert. The statements often accompanying liver extracts on the market that they "represent" so many hundreds or thousands of grammes of liver are meaningless and misleading. What is needed is some standard of potency; but, though the USA and Canada each have a unit of potency, no such standard is demanded in this country. EMERY and HURRAN [12] have lately suggested that DELLA VIDA'S formula as applied to the red cells over the first 14 days from initiation of treatment should be accepted as a reasonable standard of effectiveness, and that the potency of an extract should be expressed in units determined by the dose required to produce this standard response divided by 14. On this basis an extract producing the required response in a dose of 1 c.cm. would be accorded 14 units per c.cm., and an extract doing so only in a dose of 10 c.cm. a unitage of 1·4 per c.cm. Some such standardisation of liver extracts seems to be urgently required, though, as FULLERTON [13] remarks, it will be unfortunate if there are several different systems of unitage.

The criterion of success in initial treatment is rapid restoration of the blood-picture to normal; maintenance presents its own problems. The first task is to keep the red cells at a normal level; the second, of fully equal importance, to abolish or keep in abeyance the nervous manifestations which to a greater or lesser degree invariably constitute part of the disorder. The problems here are not only of dosage but also of the type of extract to be preferred. As regards maintenance dosage, custom varies widely. There are physicians who as a routine give two or three injections weekly; and occasionally this may be necessary. But in many cases a "depot" dose of 4 c.cm. of a potent extract every two or three months will maintain a normal blood-picture. Here, however, a further difficulty presents itself. Of the very large number of patients now regularly receiving parenteral liver treatment an increasing proportion are becoming more or less sensitive to the injections, their symptoms ranging from the common mild and transient urticarial or asthmatic manifestations to the more severe and even fatal anaphylactic shock. DELIKAT [14] and others have shown that it is possible to desensitise such sensitive patients, but this is troublesome. Alternatively the dose may be divided up and given in repeated injections starting with a minimal fraction, and then spaced and increased according to the patient's tolerance. This procedure may take from an hour or so in the less sensitive up to the better part of a day in the more sensitive patient. Knowledge and experience both support the view that the shorter the interval between injections the less the likelihood of sensitisation. As a routine small injections at intervals of 3 or 4 weeks may eventually be found more satisfactory than larger doses at longer intervals. It has been claimed that the more highly purified types of liver extract, such as those composed largely of the Dakin and West fraction, induce sensitisation less readily than the cruder forms containing a high proportion of the total solids of the original liver. Though the validity of this claim is doubtful, it brings into prominence yet a further problem. The well-known fact that in pernicious anæmia either the nervous or the hæmatological manifestations dominate the clinical picture suggests that development of the syndrome depends on deficiencies in at least two separate factors, one affecting the maturation of the red cells and the other nerve metabolism. Many observers suspect that the purer extracts, although active in rectifying hæmopoiesis, have less influence on the nervous and other metabolic disturbances than the cruder ones. Cases are seen in which glossitis recurs and persists in spite of the maintenance of a satisfactory red-cell level. It has become clear that liver contains a number of factors, deficiency (and possibly also imbalance) of which may bring about pernicious anæmia. Liver is a rich source of vitamin B_1 and of the whole B_2 complex, and it is the custom of many manufacturers of the highly refined extracts to reinforce them with aneurine and all the known B_2 factors. Whether or not these highly refined and reinforced extracts can satisfactorily replace the cruder types remains to be decided.

The outstanding questions can be answered only by collaboration between clinical observers and the makers of the therapeutic preparations. No preparation should be allowed on the market until its worth has been proved, and this can be done only by clinical trial. Cases suitable for trial purposes are not rare, but in present circumstances their value for assay purposes is too often ruined by the indiscriminate use of liver before they reach a centre at which treatment can be controlled. The Ministry of Health has laid it down that "no person shall administer any liver extract or cause or permit any liver extract to be administered, to a person who is not suffering from pernicious anæmia or from some other megalocytic anæmia." [15] It is impossible to diagnose pernicious anæmia in the absence of detailed laboratory investigation, and a case can thus be made out for distributing liver extracts only through properly staffed and equipped anæmia clinics. This would give some assurance that diagnosis preceded treatment; it would thereby do away with much waste of time and material; and it would make plenty of subjects available for the essential assay of preparations as a condition of distribution. A precedent is even now coming into existence in the control of penicillin supplies.

THE Medical Research Council have appointed Prof. A. A. MILES, FRCP, of the chair of bacteriology at University College Hospital medical school, to their staff at the National Institute for Medical Research as from Oct. 1, with a view to his becoming director of the Department of Biological Standards on the retirement of Sir Percival Hartley, FRS, next year.

12. Emery, W. B., Hurran, W. J. *Brit. med. J.* 1945, i, 75.
13. Fullerton, H. W. *Ibid*, Feb. 10, 1945, p. 197.
14. Delikat, E. *Ibid*, 1943, i, 539.
15. Statutory Rules & Orders (1944) No. 32. Made by the Ministry of Health under Regulations 55 of the Defence (General) Regulations, 1939.

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Annotations

HUNGRY NEIGHBOURS

EVERYONE is now familiar with reasons why, long after liberation, the people of France and Belgium are physically no better off than they were under German rule. We know that most French and Belgian ships are needed in the Allied Shipping Pool, which has to serve the war in the Far East as well as the West. We know that the Continental ports in Allied hands have worked to capacity. We know that shortage of locomotives, trucks, and lorries often prevents the transport of food from one part of the country to another. We are also told that everything possible is being done to relieve the situation.[1] Yet the fact remains that we are missing a golden opportunity to prove, as a people, that we really care about our neighbours and Allies. Is it quite certain that more of the supplies sent to this country for civilian consumption could not usefully be diverted to France, Belgium, and liberated Holland? The French Minister of Information has stated (rightly or wrongly) that Britain, with six months' stocks of all commodities, is still importing 2 million tons a month, whereas France, with only a day's stock of food, coal, and other essentials, is importing only 150,000 tons.[2] In this country nutrition is said to have improved rather than worsened during the war, and in the past six months the diet here has if anything grown better. On the other hand, to give a single instance, our special correspondent reports on p. 281 that when he left Paris at the end of January no fat of any kind had been distributed to the citizens since December. Lack of fats in Paris in the cold weather may be primarily due to lack of transport; but a writer in the French journal *Combat* remarks that the liberating armies have used for their own purposes 60% of the surviving French locomotives and goods wagons.[3] He and his fellow-countrymen are well aware that war needs come first, but he reasonably asks how far this doctrine is to be pushed. The *Manchester Guardian* inquires "what would be said here if the French urged that civilian transport in Britain and the United States should be reduced to a point at which people died of hunger and cold because food could not be moved from one place to another?"[2]

It was fortunate for us that the government and people of America saw fit to regard the food resources of the United Kingdom and the United States as a common pool. The result has been that for years we have had enough to eat. The official view, based on experience, is that the food-supplies of the British people could not be reduced without possible harm to our output, health, and morale[4]; and last Tuesday Mr. Churchill rejected the idea of reduction. But few will wish their morale to be maintained at the cost of Allied populations who have suffered far more severely than ourselves. To meet an emergency the British public would certainly be willing to accept stricter rationing for a time, if that would do anything to relieve our neighbours' plight and so serve the purposes for which the war is being fought.

PACK PALSY

CARRYING heavy packs during military training can produce a paresis of the shoulder-girdle musculature from nerve injury. The isolated serratus palsy is a well-known lesion sometimes associated with specific fevers, febrile "brachial neuritis," or protracted malposture on the operating-table, but usually traumatic. The typical picture of the condition in civil life is that given by Overpack and Ghormley,[5] who recorded 28 cases, the majority in labouring men affected in the right shoulder; 23 had a clear history of trauma, and, though prognosis for function was fair, gross scapular winging often persisted.

In this war, in military hospitals, a rather different type of case has been seen—an isolated serratus palsy after carrying a heavy pack. Woodhall[6] claims that the lesion is common and describes 3 atypical cases demonstrating bilateral affection, additional involvement of the trapezius and other scapular muscles, and paralysis of the trapezius alone. The actual trauma may consist of one or many days' training with a pack, or the acute strain of heavy lifting; and there is some predisposition in people with long necks and oblique sloping shoulders, and in cases where previous damage to the accessory nerve has already allowed the scapula to sag. The results of treatment in recorded cases are dismal; recovery is slow and rarely complete, and the men become sullen and resentful habitués of military hospitals. It may be that earlier recognition would favourably affect the prognosis, as Ilfeld and Holder's case[7] shows; here complete recovery occurred after a month's muscular relaxation in a modified spica holding the arm adducted to the side with upward pressure beneath the flexed elbow. But such cases are likely to be rare, and it seems wiser as a rule to return Service patients to duty in a lower category after a few weeks of development of the unaffected shoulder-girdle muscles. Complicated methods of fixation, and certainly operative intervention, are neither desirable nor effective.

It is interesting to speculate whether some of the recorded paralyses were in fact specific or only part of syndromes which have since become recognised. Thus, one of Richardson's cases,[8] with tingling paræsthesiæ in the radial side of the forearm and in the ring and middle fingers, might have fitted into our present picture of cervical intervertebral disc prolapse.[9] And again, carrying a heavy pack with shoulder straps appears to be the ideal way to produce the backward and downward bracing of the shoulders which is the essential factor in costoclavicular compression of the brachial plexus.[10] Perhaps further cases, reviewed in this light, may reveal neurological features in the distal part of the limbs accompanying the obvious muscle palsies.

VD IN SEAMEN

"Venereal disease is responsible for approximately 10% of illnesses among merchant seamen."

"The incidence of venereal disease is very much higher in the ports than elsewhere . . . we must not therefore be without concern for the civilian population."

THESE facts are given by Dr. D. T. Richards,[11] chief assistant port medical officer for Bristol, and in the present concern for the welfare of seamen the problem of control and treatment of venereal diseases among them should not be overlooked. There are in most seaport towns of Great Britain facilities for diagnosis and treatment, and provided adequate supplies of penicillin are available it ought to be possible to cure most of the declared cases of gonorrhœa while the ship is in port, tests of cure and the exclusion of syphilis being carried out when the ship returns to its home port at the end of the voyage. Syphilis presents greater difficulties, and in 1943 the Ministry of Health recommended that infected seamen should, whenever possible, be brought ashore for initiation of treatment, after which they should be transferred to a ship carrying a surgeon who would continue the treatment, or to a coastal vessel in home waters to enable them to attend a shore clinic at short regular intervals.

1. See *Lancet*, Feb. 24, p. 255.
2. *Manchester Guardian*, Feb. 19, p. 4.
3. Quoted in *Manchester Guardian*, Feb. 19.
4. Food Consumption Levels in the United States, Canada, and the United Kingdom. HMSO, 1944.
5. Overpack, D. O., Ghormley, R. K. *J. Amer. med. Ass.* 1940, **114**, 1994.
6. Woodhall, B. *Bull. US Army med. Dept.* December, 1944, p. 112.
7. Ilfeld, F. W., Holder, H. G. *J. Amer. med. Ass.* 1942, **120**, 448.
8. Richardson, J. S. *Lancet*, 1942, i, 618.
9. Elliott, F. A., Kremer, M. *Ibid*, 1945, i, 4.
10. Falconer, M. A., Weddell, G. *Ibid*, 1943, ii, 539.
11. Minutes of the Association of Port Health Authorities of the British Isles for Sept. 22, 1944.

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Intensive treatment of early syphilis, either with penicillin or arsenicals and bismuth, is now becoming universal in the Armed Forces, and considering the importance of the seaman's rôle in the national life, especially in time of war, it seems only right and economically sound that facilities for these more rapid methods of treatment should be provided at all the chief ports of the Empire. Syphilis declaring itself on the high seas or in foreign ports may, after diagnosis, have to be initially treated by standard methods, but treatment could then be rapidly concluded when the ship reached home. Time-honoured methods, involving weekly injections over months or years, often result in default among shore-going patients, and only too often they spell disaster to the seaman. Usually he is faced with the alternative of either relying on such intermittent treatment as he is able to get when his ship touches at a foreign port, or of "swallowing the anchor," trusting to get an uncongenial and worse-paid job ashore. Not unnaturally he normally takes the former course, often with tragic consequences.

Is there any reason why syphilis should not be notified and compulsorily treated in the Merchant Navy as it is in the Armed Forces? The fact that merchant seamen live in such close community makes this highly desirable; and, were the principle enforced by statute, the criminality of concealment would follow. There must, however, be no penalisation, and in cases where a short period of hospital care is necessary, in both the seaman's and the company's interests, it would be inadvisable that the patient should lose any pay. Venereal disease among seamen can almost be said to be attributable to conditions of service.

All United States merchant vessels now carry an officer, usually the purser, who has had four months' training in the elements of medical and surgical treatment, including that of VD. It is not clear to what extent these officers actually carry out treatment, but with suitable safeguards, which should include the "logging" of each case treated and the amount of drugs expended, there is no serious objection to their treating gonorrhœa. The treatment log would then be checked at the home port by a responsible medical officer, and the patient obliged to attend a clinic for tests of cure on his return. The diagnosis and treatment of syphilis, on the other hand, must always remain the responsibility of a qualified expert; and indeed all cases of genital ulceration should be sent to hospital at the earliest opportunity.

CHARING CROSS MOVES WITH THE TIMES

IN the opinion of the Middlesex County Council public health committee, the new plans for Charing Cross Hospital foreshadow "a degree of coöperation between voluntary and public services which has never before been achieved." These plans provide for the rebuilding of the hospital, with about 1000 beds, on the Northwick Park golf-course near Harrow. In a letter presented to the council last week Mr. Philip Inman, chairman of the hospital, shows that three departures from precedent are contemplated. First, it will be necessary, he writes, to provide 100 beds for the care of the chronic sick—"a type of patient which has hitherto not been admitted to the majority of teaching hospitals, notwithstanding the fact that doctors in general practice have to treat such patients." Secondly, though it is essential for a teaching hospital to maintain some selection of cases, Charing Cross is willing to set aside a proportion of beds for local needs and use them to provide a complete hospital service for the inhabitants of a definite area: except for certain infectious diseases, and mental disorders requiring observation, it would, like a municipal hospital, undertake to admit all cases applying from its area and needing impatient care. Thirdly, the medical school would welcome an arrangement whereby undergraduate students would be seconded to a county hospital for 3–6 months of their clinical training: during this period "they would have opportunity of being instructed by the council's medical staff upon types of cases not infrequently encountered in the wards of voluntary hospitals, and would also learn something of the social and health services developed in the county."

Mr. Inman quotes a remark by the president of the Royal College of Surgeons that "the great need of the moment is to bring together those who are natural partners in the planning of a health service and to get them to go forward in full partnership." He thinks of the proposals as an experiment in coöperation that may go far to remove the barrier, "set up largely by insufficient knowledge and wrong thinking," between the voluntary and municipal hospitals. He hopes, as we all do, for a new unity among those whose common concern is the welfare of the sick.

AUSTIN FLINT MURMUR

Austin Flint can hardly have guessed, when he published his paper *On Cardiac Murmurs*[1] in 1862, that it would result in his name being handed down to generations of students and much heart-searching among cardiologists. For he described only 2 cases with the "presystolic blubbering murmur" since attached to his name, and saw it for what it is—an extreme rarity. Every student up for his final is now familiar, in theory at least, with the presystolic apical murmur in cases of aortic regurgitation without mitral disease, but there has always been a suspicion that as often as not when a Flint murmur is diagnosed there is a coincident mitral stenosis.

Luisada[2] has made a phonocardiographic study of 27 patients with aortic incompetence due to syphilis or atherosclerosis, in none of whom was there any evidence of rheumatic heart disease, and has demonstrated some acoustic phenomena at the apex which might be confused clinically with Flint's murmur, though they have little in common with the blubbering sound he described. These noises can be divided into three groups. In group 1 a diastolic murmur apparently arose from functional changes in the ventricular wall; on analysis this rumble was found to be made up of a loud auricular sound either alone or plus a loud third heart sound. In two of the patients in this group a Flint murmur had previously been diagnosed with the stethoscope. In group 2 the phonocardiogram showed that what had been called clinically a crescendo presystolic murmur was actually a distorted first sound occurring in systole. In group 3 there was splitting of the first sound produced by separation of either its two valvular components or its musculovalvular components; here, if the second part of the split sound is mistaken for a normal first sound, the first part may be called a presystolic murmur. Luisada contends that none of his patients had a true Flint murmur, though it had been diagnosed in four of them by competent cardiologists. He mentions, too, that he has found phonocardiographic evidence of mitral stenosis in "many other" cases in which the clinical diagnosis was syphilitic heart disease with a Flint murmur. This douche of cold water on clinical credulity should lead us to insist on a phonocardiographic record before a Flint murmur is diagnosed; and if we are presented with a possible one at our final examination the chances will be on our side if we express polite disbelief.

Mr. PERCY BARTER, a principal assistant secretary of the Ministry of Health since 1940, has been appointed a senior commissioner of the Board of Control, and the Minister of Health has appointed him to be chairman of the Board on the retirement of Sir Laurence Brock on March 31. He was secretary of the Board from 1930 to 1939.

1. Flint, A. *Amer. J. med. Sci.* 1862, **44**, 29.
2. Luisada, A. A. *Amer. Heart J.* 1944, **28**, 156.

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Special Articles

FRANCE TODAY

(FROM OUR SPECIAL CORRESPONDENT)

FOR its information on health, nutrition, and epidemics the French government now relies on reports by the Institut National d'Hygiène. The institute, which began work in 1942, published last year a first report from its director, Prof. A. Chevallier, to the minister of public health.[1] More recently it has prepared a series of multigraphed reports on nutrition, tuberculosis, cancer, alcoholism, epidemic diseases, and venereal diseases which extend over the period of enemy occupation and the period of liberation up to the end of 1944.

Food

The opening words of the report on nutrition indicate very correctly both the value and limitation of such studies:

> "The conditions of nutrition observed during the occupation were of extreme diversity. Conditions as to the provision of foodstuffs were essentially different in town and country, as well as in different social groups; even in the same social group there were great differences."

For these reasons it was, and is, impossible to generalise. The definite statistics of nutrition are those collected in urban areas, but the mortality and tuberculosis statistics throw light on the problem from another direction.

RATIONING AND ITS EFFECTS

It must be explained that rationing in France during the occupation was more elaborate than in this country. Men and women were dealt with separately, as were children from 0–3 (class E), from 3–7 (class J1), from 7–14 (class J2) and from 14–21 (class J3). Manual workers were divided further into those doing heavy and those doing light work. The standard of food requirements accepted is that agreed by the League of Nations. One of the most complete inquiries on food-supply and nutrition was made at Marseilles by the local section of the institute, covering a period of four years. And table I shows the percentage of League of Nations standards of calories, animal protein, and fat received at Marseilles in 1943:

TABLE I

Ration class	Calories (%)	Animal protein (%)	Fats (%)
Adult male	77	43	31
,, female ..	63	40	31
Children 14–21 ..	75	36	31
,, 7–14 ..	80	63	46
,, 3–7 ..	118	60	48

One of the results of the insufficiency of the rations was a fall in the weight of adults in the urban areas. It is stated that in the first year of occupation 70% of adults in towns (male and female included) lost 12% of their weight. After this time the weight slightly increased, but it remained about 10% less than before the war. The adults who lost weight were for the most part over 45 years of age, and those who had been above average weight.

Statistics of loss of weight of workers in two factories in the suburbs of Paris make this point clear. Table II gives the average weights in kilogrammes.

An inquiry by the institute as to the weight of babies at birth (in 1943) carried out in Paris showed that it remained the same as before the war. Children up to 10 years of age also increased normally in height and weight; but after 10 growth both in height and weight was considerably retarded, especially at 14 and 15.

There were also other signs of malnutrition. Of the adolescent girls at a residential institution 70% suffered from amenorrhœa, which was cured by doubling the protein ration from 8·60 to 17·2 g. There were sporadic cases of famine œdema in the civilian population, and

TABLE II

	Genevilliers (1500 workers)			Aulnay (800 workers)			
Before war	1942	1943	1944	1940	1941	1942	1944
74·1	64·5	65·3	65·5	76·5	66·3	62·3	67·00

Average loss of weight in relation to age: Under 41 .. 8 kg. | 42–47 .. 9·5 kg. | Over 48 .. 12·6 kg.

epidemics of it in prisons, institutions, and internment camps. Since liberation, despite an improvement in the official ration, there has been a sudden deterioration in the condition of children of the poorer classes in Paris, of whom many have been found underweight. There has also been an increase of vitamin deficiencies at Marseilles.

Marseilles is a large city whose population was particularly badly fed. In the years 1940–42 the food consumed daily by all classes of adults (male, female, light workers and heavy workers) was as follows:—

Carbohydrates .. 26·2 g. | Protein (animal) .. 21·6 g.
Fats .. .. .. 30·6 g | ,, (vegetable) .. 42·3 g.

Total calories per diem: 1765. In addition 195 calories were obtained from spirits and wine.

The condition arising from this diet was not directly and immediately serious: there was loss of weight and then stabilisation; there was weakness and inaptitude for work; and there were signs of vitamin deficiency. Nevertheless the years 1940–42 showed a considerable increase in the death-rate compared with 1938.

Inquiries made concerning infants, children of school age, and adolescents (up to 21) in Marseilles, Lyons, and Paris showed that the younger children most nearly approach normal weight. Among adolescents weight was stationary or falling in 31·3% of boys and 39·2% of girls. Among children of 7–10 years 33·4% of girls were below weight and 27·7% of boys.

OCCUPATIONAL AND GEOGRAPHICAL DIFFERENCES

A review of food conditions in different social groups revealed great diversity in the amount of food consumed. In Marseilles in the winter of 1942–43 the normal adult had to be content with food which only reached the 1200-calories mark. Others, by purchasing in the unrationed market and in the black market, could get a full diet. The gross inequalities in distribution of food in France are freely admitted in official publications.

TABLE III

Occupation of parent	Weight lost	Weight stationary	Tuberculosis under 14
Cultivateur ..	2·1	3·5	..
Commerçant ..	5·3	3·9	2
Industriel ..	3·6	11·4	4
Professions libres	10·7	15·7	..
Fonctionnaire ..	13·4	22·2	7
Artisan	11·2	14·8	3
Ouvrier	35·2	23·4	14

Table III, obtained by examining a large number of school-children in Lyons in 1942–43, shows the percentage with decreasing or stationary weight, arranged

1. Recueil des Travaux de l'Institut National d'Hygiène, vol. i., 45 rue Cardinet, Paris.

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according to the occupation of their parents, and in relation to the number of cases of tuberculosis in children under 14.

The *cultivateur*, who grows food, is best off; the *commerçant* (small business man or shopkeeper) and the business manager have opportunities of getting about; the *professions libres* (doctors and lawyers) do not do so well but have no tuberculosis; the *fonctionnaire* (civil servant) and the *artisan* (skilled worker) are evidently suffering in diet; but the ordinary *ouvrier* (manual worker) is in every respect worst off.

Another sidelight is found in the differential mortality of the administrative departments into which France is divided. In some departments there has been a rise in the death-rate (calculated per 100,000); in others there has been a decline. The following increases are recorded: urban and industrial areas of Paris and Seine region, 23·1; Marseilles and Bouches-du-Rhône, 54; Bordeaux and Gironde, 12·9; Nord region (industrial) 8·0; Lyons region 27·8. In the departments of Var, Basses-Alpes, and Corsica there have also been large increases in mortality; these three departments are not urban, but they are stony, agricultural, non-productive areas. Death-rates have decreased, on the other hand, in Normandy and Brittany, in the Somme, the Aisne, and the Marne districts, in Nièvre and the Côte d'Or, in the Landes, Lot-et-Garonne, Lot, Aveyron, Puy-de-Dôme, and many other departments.

Thus in looking at the map of France we see that urban areas and certain non-productive rural areas on the Mediterranean coast have deficient food, a high incidence of tuberculosis, and increased general mortality. But around these black areas, neighbouring them, are the rural productive farming areas of France in which food is plentiful and death-rates less than they were before the war.

CAUSES OF MALNUTRITION

The reasons for malnutrition in France are to be found partly in the effects of the long-standing underfeeding during the enemy occupation and partly in the disorganisation of road, rail, and canal traffic caused by the military effort for liberation. The Germans deliberately underfed the people of France. Agriculturally self-supporting for all practical purposes, France was made to yield to the Germans enormous quantities of foodstuffs, and to pay for them as costs of occupation. In the towns there is not only a shortage of food, there is a shortage of all ordinary consumer goods—the things that the housewives of the farming community want to buy as well as the housewives of Paris, Lyons, Bordeaux, and Marseilles.

The Germans also deliberately encouraged the black market, partly as a means of making easy money, and partly as a means of demoralisation.

Ordinary rations of food being insufficient, there was at once a demand in the black market for foods such as eggs, milk, meat, and fruit. Furthermore, for the peasant farmer in France to withhold from the Germans a proportion of the foods he attempted to collect for his own purposes was an act of patriotism. To sell food illegally to French civilians or to Frenchmen fighting in the FFI was an assistance in the war against the German invader. But the secret black-market organisation set up still persists, and is now interfering with food distribution.

The black market cannot be cured entirely by fines and imprisonment; it must be prevented by providing enough food for all, and enough consumer goods for all. The sure way is to get the work of the factories going again, and the work of the fields. And for that the first need is transport by road, rail, river, and canal.

Despite the best endeavours of the French authorities and the most ample help the Allies can give in provision of transport, of raw materials for the factories, of seed and fertilisers for the fields, and of certain foods to tide the people over until crops are harvested, there is bound to be a period of difficulty. But so far there is at least one consoling feature of the French internal situation—there is at present no threat of any epidemic. There is in France too the feeling of renaissance, the feeling of a new spirit of the Liberation Movement, the renewed determination to act and to conquer the troubles which face her.

Hospitals

The day on which I had arranged a series of visits to Paris hospitals was freezing cold, with the ground covered with snow. And there was practically no coal at all in the city. But my visit to the Hôtel-Dieu reassured me about hospital heating. For the building, though not very warm, was not at least as government offices, banks, and private houses were—as cold as a good refrigerator.

The doctors I met at the Hôtel-Dieu, who very courteously showed me their wards and discussed their problems, were among the best-known members of the medical profession in France. In the order in which I saw them they were: Dr. Garcier (neurology), Professor Fiessinger (clinical medicine), Dr. Nicaud and Dr. Henri Benard (general medicine), Dr. Barietz (tuberculosis), and Prof. Pierre Brocq (clinical surgery).

One of my first questions was on the subject of heating, because I had been told on good authority that in some places it had been impossible to get coal, impossible to warm the hospital or operating-theatre, and obligatory to refuse even acute abdominal operations. Fortunately there was some coal at the Hôtel-Dieu and they had not had to refuse operations; but they were not sure of supplies for more than a few days. This again is a question of transport, and the shortage very seriously impedes the work of office and hospital as well as factory and workshop. At the time of my visit to Paris the electric light and power for offices and homes was cut off in the morning and only turned on again in the evening; but hospitals were privileged and light was available.

Walking round the wards, my chief impression was of overcrowding, and of many elderly surgical and medical cases. Accommodation at the Hôtel-Dieu was, I was informed, 900 beds. But they had had to put in extra beds and had 1200 patients under treatment. There were beds in the middle of the wards; beds coming right up to the doors of entrance into the wards; beds set up very close together; and beds (eight or ten of them) in an entrance hall, open to one of the main corridors, which gave access to an operating-theatre. I was told they had had patients in beds in the corridors.

A large proportion of the patients in the hospital were chronic cases—old people suffering from cold, fatigue, and respiratory affections. There were also a number of cases of fractured femurs in old people. Another class of case emphasised the great increase in acute tuberculosis. A few days before, the Hôtel-Dieu had admitted a man of 56 with the diagnosis of bronchitis; he died in three days and the post-mortem showed acute tuberculosis.

Views of the Medical Profession

At the Hôtel-Dieu surgeons and physicians alike complained of shortages. They were short of insulin, of gland products, of requisites for the laboratory, and of X-ray film. They laid strong emphasis on the ill effects of lack of all heating in the homes of the vast majority of the workers of Paris. For clothes and shoes, they could manage; but food was insufficient. Vitamins, I was told very emphatically, are not the problem: what is needed is meat and fat. And I may mention here (that up to the day I left Paris, Jan. 29) no fat of any kind had been issued in the ration of the Parisian since December.

The civilian food ration was a matter of grave concern to the hospital authorities, for they depended on it for

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the hospital supplies, and food shortage in hospital creates many difficulties.

A few days after I left Paris the frost broke and a thaw cleared the streets. If the hard frost had continued the Hôtel-Dieu and other hospitals would have been very hard-pressed to provide for those seeking admission. Paris is overcrowded, and although extra hospital accommodation is needed, it is almost impossible to find. Civil and military needs are pulling in a tug-of-war.

CHILDREN

My next call was on Prof. Robert Debré, of the Paris Faculty of Medicine, at the Hôpital Necker, an 800-bedded hospital for children. The hospital was not overcrowded, for there has not been any great increase of illness among children. Professor Debré told me that infants up to one year get an adequate diet, including milk; but they have suffered from the cold weather and there have been admissions for bronchitis, bronchopneumonia, and otitis. The mortality from these diseases has risen from 6 to 10% because the infants' resistance has been lowered. And this applies even though there is a ration of coal for children under one year. I wondered if everyone got the ration. And I remembered and understood an experience I had had shortly before, when lunching in a private flat. We lunched in a small room leading out of the nursery in which two children slept—one an infant of a few months and the other a baby of 2–3 years old. We lunched in that room because the small stove warming the nursery was the only fire and the only source of heat in the flat. My friend had a good position in the public service and his wife devoted herself to the two infants. I hope all other young babies in Paris were as warm as they were on that day, and as well looked after; but I doubt it.

Professor Debré laid great stress on the lowering of the power of resistance to disease among children and adolescents, but said that there was no increase in infectious diseases. The only notable change with regard to diseases of children was the increase of tuberculosis.

Young people from 6 years of age to 20 did not get enough food—particularly not enough fat. Children and young people were thinner and shorter than they ought to be; they did not reach the normal. And this was particularly evident in boys.

We discussed the difference in health conditions in town and country in France, and Professor Debré agreed that there had been an actual improvement in the health of some rural areas, which he put down to a diminution in cases of alcoholism as well as to the adequate supply of food which food-producers are able to ensure for themselves.

FATIGUE, TUBERCULOSIS, AND ALCOHOLISM

My next visit, to Professor Justin-Besançon, president of the French Red Cross, enabled me to renew a contact I had made with the French Red Cross Societies many years ago. The three societies are now merged in one organisation, which carries on its work on the same lines as formerly, providing help for both military and civilian services. Professor Justin-Besançon spoke particularly of fatigue as a factor adversely affecting the general level of health.

Professor Troisier, of the Faculty of Medicine, whom I saw at his house at Auteuil, drew special attention to the increase of tuberculosis by 25% between 1941 and 1942, and on the increase of tuberculous meningitis. He also referred to the considerable increase in cases of pulmonary tuberculosis in which diagnosis is made by recognition of the tubercle bacillus in the sputum at a tuberculosis dispensary.[2] The number of these cases per 100,000 was 141 in 1938, 161 in 1941, and 176 in 1942. The total population dealt with was 1,759,000 (cases 2596) in 1938, 1,436,000 (cases 2337) in 1941, and 1,397,000 (cases 2451) in 1942. The fall in population in 1941 was due to the war, and despite this fall in density of population the proportion of cases increased. It should be mentioned that the 1938 figure of population is taken from the census return of 1936, and the population figures for 1941 from the records of food ration cards. Professor Troisier thought that there was now a regional amelioration of tuberculosis; but what the relation of that factor is to others in the picture of public health in France is difficult to determine.

The decrease in alcoholism, previously mentioned, is one in which Professor Debré has interested himself, and the facts are of great medical interest. Owing to the war and the restriction in distribution of supplies and restriction on opening of cafés, there has been a great drop in the consumption of spirits in French rural and urban areas. The Institut d'Hygiène says that alcoholism in France has practically disappeared. Cirrhosis of the liver, polyneuritis, and gastric troubles of alcoholic origin are almost absent from the hospitals of France.

Cases of alcoholism fell steeply in Paris, in Nancy, and at Angers in 1942–43; but in Montpellier, where consumption of wine and spirits was almost unrestricted, they increased greatly between 1939 and 1941.

Taking mortality from cirrhosis of the liver as a measure of alcoholism, here are the figures of deaths per 100,000 population:

1936	*1937*	*1938*	*1939*	*1940*	*1941*	*1942*	*1943*
37·1	35·6	34·5	33·3	34·8	35·7	18·6	10·6

The improvement in general mortality-rates during the war in certain rural areas, such as Normandy and Brittany, is partly ascribed by some medical opinion in France to a reduction in the consumption of spirits. As the institute says, France during the war has made a greater experiment on the effects of alcohol than did the United States with its system of prohibition.

(To be concluded)

THE DOCTOR DEMOBILISED

FROM OUR CANADIAN CORRESPONDENT

THE problem of "rehabilitation" of medical officers of the Canadian Armed Forces is under consideration and a solution is offered. The unknown quantity is the rate at which these officers will be returned to civilian life.

Early in the war the Government set up a Medical Procurement and Assignment Board to provide doctors for the Forces and to protect the people of Canada by ensuring that no large area should be left medically uncared for. This board has done a good piece of work, and the Forces have been adequately supplied with over 4000 medical officers. Normally there are about 10,000 doctors practising in Canada, but retirements have been deferred and the people are being given almost full service by the 6000 practitioners still available.

To provide a pool of medical officers the nine medical colleges have accelerated their courses so that the work of six academic sessions has been done in 4 calendar years. The students have been enlisted in their fifth academic session and are under control of the military authorities until as graduates they have served a hospital internship of 8 months. They have then been commissioned in the Services.

Thus it is that nearly half the medical officers in the Canadian Forces have never been in private practice. For the purposes of the MPA Board they are classified into six groups according to status at time of enlistment:

1. (*a*) Students graduated in accelerated courses. (*b*) Students graduated before acceleration began and commissioned after internship.
2. Students taking postgraduate courses and not yet in practice.
3. Practitioners less than 5 years in practice.
4. Practitioners between 4 and 9 years in practice.
5. Practitioners under 40 years of age and 10 or more years in practice.
6. Practitioners over 40 years of age.

2. Troisier, J. *Bull. Acad. Méd.* May 18 and 25, 1943.

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Some time ago Canadian medical officers were given a questionnaire as to their wishes as regards rehabilitation. The first 1800 replies showed that over 90% of the men and women wanted a period of graduate study before entering or resuming practice. The time asked for varied. Of 1633 people who wanted a term of postgraduate work, 10·4% asked for a period up to six months, 21·1% from six to twelve months, 22·8% one to two years, 14·2% two to three years, 5·1% three to four years, 1·9% four to five years, and 0·3% five years. The remainder did not specify the length of time desired.

The question as to where it was desired that this time be spent was answered as Canada 32·2%, United States 19·8%, and Great Britain 6·8%. The remainder made no choice.

A survey has been made of the facilities available in Canada to satisfy the demand implied in the response to the questionnaire. The Canadian medical schools and hospitals are prepared to take care of a maximum of 1200 postgraduate students a year. This will mean that centres with large hospitals not connected with any college will be assigned part of the work. For instance the Civic Hospital in Ottawa, with 900 beds and a very competent staff, could provide for 25 to 40 or more. Just now they are getting along with 8 interns!

The Government is prepared to finance postgraduate training in a very liberal manner. A committee representing the universities, the Royal College of Physicians and Surgeons, and the Canadian Medical Association will be in charge of the situation. The Medical Procurement and Assignment Board will continue to function in its advisory boards in every Province. All officers in classes 1 and 2 in the schedule will be eligible, and the others will be given liberal consideration on application. Married men will be paid $80 a month with allowances for children, and single men $60. The Government will pay all fees for tuition and all moneys thus paid will be free of tax. Those officers not willing to spend time in postgraduate study will receive a grant in money instead of the benefits given those who accept the opportunity. A further provision is made for rehabilitation loans up to $5000 at 3% interest repayable within 12 years. Depending upon length of service and other factors, medical officers may receive $7000–10,000, with 60% of the sum repayable.

The United States will have 50,000 of its own officers seeking graduate training, so there is scant hope of any Canadian sharing in the facilities of that country. Probably Great Britain will be equally inaccessible. Should demobilisation be complete at the close of the war, all Canadian officers could not find opportunity in Canada; but medical services will be required long after the troops return, for every man is to be "boarded." The 1200 places per year will probably provide every demobilised medical officer with the opportunity he desires.

MASS RADIOGRAPHY IN ACTION

A NEW method in diagnosis needs thorough and careful trial before it can be used to best advantage. In a guide[1] to administration and technique with a mobile miniature radiography (MR) apparatus the Medical Research Council have provided a model for subsequent investigations, and include a survey of results which drives home the lessons of other radiographic surveys made in recent years.

Those responsible for the report are Miss Kathleen C. Clark, FSR, Dr. P. D'Arcy Hart, Dr. Peter Kerley, and Dr. Brian C. Thompson. A description of procedure, occupying about half the report, gives details of every step in the investigation, including specimen letters to those who are to be examined, record and statistical cards, record books, and lists of requirements, with a full account of the apparatus used, the personnel needed, and the management of groups of examinees. Samples of radiograms are included. Emphasis is rightly laid on the confidential nature of the examination, and the importance of not notifying the firm, or even the firm's medical officer, of the results except with consent of the patient. The authors are responsible for training other MR teams at the London School of Hygiene and Tropical Medicine, and this first half of the report might well serve as a manual. Because of the shortage of MR units, however, it is as yet only possible to demonstrate the value of the method: a nation-wide survey is beyond our means.

1. Mass Miniature Radiography of Civilians. *Spec. Rep. Ser. med. Res. Coun., Lond.* No. 251. HMSO. Pp. 135. 3s.

RESULTS

The second half of the report, which deals with results, has an interest for the whole profession and should be widely read. Four groups of people in the Greater London area were examined. They included workers in two factories (group A 4720 people, group B 5657), an office group (10,903), and patients (1564) and staff (198) in a mental hospital. Except in the case of the mental patients attendance for X-ray examination was voluntary, and the report demonstrates how much the response depends on methods of approach. Thus at factory A 90% of employees available during the inquiry accepted examination; at factory B only 39%. Many factors may have been responsible for this, but the investigators note what they hold to be the most important.

> At factory A the shop stewards and supervisory staff had discussed the proposal fully with the medical director of the unit, and the factory medical department took a full part in the publicity; a keen woman medical officer gave talks to groups of workers and the sister in the department visited the shops to collect volunteers and to arrange the times of their appointments. A list of the names of employees was supplied to the unit, for checking.
>
> At factory B preliminary discussions were less complete and fewer members of the factory staff attended them; publicity was less thorough, employees were left to volunteer on their own initiative, and no list of names was supplied. A severe influenza epidemic at the time may have contributed, but allowances had been made for recorded absences during the survey, so this should not have affected the percentage figure, which was calculated on the staff available on the day of examination.

The results tallied well with those of nine other surveys made in Great Britain during war-time, and like them reveal an incidence of lesions requiring treatment which is startling when considered in relation to available beds.

> In the two factories and the office the proportions recalled for full-size films were 5·5%, 6·3%, and 5·1%. These of course included people with non-tuberculous as well as tuberculous lesions. The total incidence of newly-discovered tuberculous lesions ranged from 1·1 to 1·6%, and the percentage needing treatment from 0·3 to 0·4. The rest needed careful observation checked at intervals by radiography. The incidence of total cases tended to increase with age in the men, and to decrease in the women. Thus, as common experience shows, women supply most of the cases in young people, and men most of the cases in older people.

IMPLICATIONS

These findings suggest an immediate need for 3 sanatorium beds per 1000 of adult working population, and dispensary service for over 10 per 1000. This should not on any account lead to an ostrich-like postponement of surveys. It would be inept and feeble to say that because we lack beds to put them in we had better not look for the cases. On the contrary, it is rather our duty to discover the total numbers of these early cases in order that we may recognise the full extent of our commitments and hasten to meet them. It is noteworthy that, as the report shows, many people with lesions serious enough to need treatment have no symptoms. Moreover we have still much to learn about the course of cases in which the lesions are minimal and symptoms absent.

Besides newly-discovered cases, there were 0·4% of cases previously diagnosed as pulmonary tuberculosis in both factories A and B, and 0·2% in the office group. Some of these were under medical care, but others—perhaps because they had moved from one district to another, or for some other reason—were under no supervision. That considerable numbers of people known to have pulmonary tuberculosis are at work, and that no special provision has been made to safeguard either them or their fellow workers, in itself deserves grave consideration.

The morbidity in the single mental hospital investigated was high among patients—3·5% of newly-discovered significant lesions and 1·3% of cases needing treatment. The mortality-rate from tuberculosis was

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5 to 10 times as great in mental hospitals as in the ordinary population even before the war, and the present figures, regrettable as they are, might have been expected. They are a measure of the defects of our many antiquated, overcrowded, and understaffed mental hospitals, and should in themselves prove a spur to reform. The report notes that the hospital in question was one showing a high order of administrative efficiency, so we may suppose that in some others the figures would have been worse. The authors of the report suggest that local authorities owning several mental hospitals might find it worth while to build a tuberculosis hospital for mental patients, thus reducing the risks to other mental patients and providing better treatment for those who are tuberculous.

Dealing as it does with civilian groups the survey cannot be compared directly with those made on Service personnel, where methods of classifying cases have been somewhat different, and where those examined had already been "selected" by medical examination. In so far as the figures are comparable the incidence of positive cases in two RAF surveys were lower than in this report; in a Naval survey in 1940–42, the incidence was also lower, but in a survey made since the figures had risen to levels more similar to those in the MRC survey.

The methods set out in this report would prove valuable in liberated countries and among the many displaced people in Germany. Tuberculosis has certainly increased in Europe though exact figures are not known. Surveys on a limited scale would enable the governments concerned to assess the extent of their problem and to prepare their tuberculosis programmes accordingly.

BRITISH COUNCIL FOR REHABILITATION

THIS organisation, whose formation we announced last week, has among its objects:

To act as a central coördinating body for the various interests concerned in the widest aspects of rehabilitation.

To promote and correlate courses of study in rehabilitation.

To invite the active coöperation of Government departments, hospitals, universities, training colleges, educational institutions, and research foundations in promoting the study and practice of rehabilitation.

To secure the active coöperation and participation of commerce, industry, and professional bodies in the problems of resettlement.

To encourage the formation of follow-up schemes for the rehabilitated.

The Council is to consist of two representatives from each of the member organisations, together with members elected by the Council (whose number must not exceed half the number of representative members) and two delegate members from each of any regional councils that the Council may establish. The member organisations and elected members at present are:

Member organisations.—Association of Occupational Therapists, British Federation of Social Workers, British Legion, British Medical Association, Central Bureau for Insurance Nursing, Ltd., Central Council for the Care of Cripples, Empire Rheumatism Council, Hospital Almoners' Association, Industrial Welfare Society, National Institute for the Blind, National Institute for the Deaf, Roffey Park Rehabilitation Centre, St. Dunstan's, the Chartered Society of Physiotherapy, the Royal College of Nursing, and the Spero Fund for the Industrial Welfare of Tuberculous Persons.

Elected members.—Dame Georgiana Buller, Mr. St. J. D. Buxton, FRCS, Mr. Norman Capener, FRCS, Dr. F. S. Cooksey, Mr. Victor Dover, FCII, Mr. E. S. Evans, FRCS, Mr. H. E. Griffiths, FRCS, Mr. S. L. Higgs, FRCS, Dr. Horace Joules, Prof. J. M. Mackintosh, FRCP, Mr. S. A. S. Malkin, FRCSE, Dr. Donald Norris, and Mr. R. W. Watson-Jones, FRCS.

Lord Rushcliffe is chairman of the Council, and the executive committee are:

Mr. Griffiths (chairman), Dame Georgiana Buller (vice-chairman), Sir Brunel Cohen, Mr. Evans, Alderman N. Garrow, Dr. F. R. G. Heaf, Dr. J. A. L. Vaughan Jones, Miss W. M. McAllister, Dr. Norris, Dr. Cooksey, Mr. W. Scott-Evans, Miss E. L. Beckett, Mr. W. P. Allen, and Mr. J. Rhaidhr Jones.

Mr. H. Vezey Strong is the hon treasurer, Miss D. A. Fraser is the secretary, and the address of the Council is 32, Shaftesbury Avenue, London, W1.

In England Now

A Running Commentary by Peripatetic Correspondents

THOSE who have been inclined to think of Guy's as a stronghold of die-hard misogyny would be surprised to see the medical school today. Women medical students and their lady professors rub shoulders with the men. They use the same physiological laboratories, perform the same experiments, occupy the same lecture theatres, and take part in the men's debates. No recommendation of an interdepartmental committee, no lure of a university grant has brought this about, but the "common enemy"; for these are pre-clinical students from a women's institution in Southern England whose premises had been rendered temporarily uncomfortable by aerial attack and the rigours of an English winter. Nor was the intervention of any billeting officer required to enforce this mixture of the sexes. A genuine desire to offer hospitality to colleagues was the only motive. The girls were not greeted with the defiant resignation of the first-class corner-seat passenger when a party "en famille" invades his self-conceived sanctity. Rather did everyone beam benevolently upon them like so many contented uncles who have just experienced the smug satisfaction of handing out a bright new half-crown piece.

The present situation does not however altogether reflect the shape of things to come. Never again is Guy's likely to be "invaded" in such strength, for when the Real Thing comes each school will be required to take only a small quota of women, and the quantitative inferiority will give them an uphill fight to achieve qualitative superiority. Nor will they then be visitors. Today's spectacle recalls the meetings at Guy's of the Physiological Society in the days of Professor Pembrey. The high spot of the afternoon would be the box of chocolates which the great man himself would proffer to each of the ladies in turn. This compliment was not even marred by the famous remark invariably uttered in those characteristic penetrating tones, as each delicate hand hung poised over the box—"Only two each, remember!"

Poor young ladies! It'll be "No chocolates for Miss Medico," in those postwar Goodenough days. On the whole I think I would avoid co-education and prefer to compete solely with my own sex were I a young woman with medical ambitions.

* * *

Those American nurses, so maturely outspoken and so dapper, have always seemed to me to shine a new lamp up the road along which our own nursing service should be marching—or preferably running. With better hours, better pay, equally good training, and the liberty to live outside the hospital and to marry, they can, and do, keep their minds broad and supple and their spirits high. It seems, however, that many don't want to serve in the Army. According to the Surgeon General at Washington the shortage there is critical.

> "Since last October," he complains, "the Army Medical Department has been stressing the need for 10,000 additional nurses. We sent a personal appeal to each one of the 27,000 nurses that the War Manpower Commission told us were available for duty. Our returns from that appeal were pitiful. We received 760 answers and signed up 227 nurses from that group."

As a result Mr. Roosevelt has asked that the Selective Service Act be amended to provide for the induction of nurses into the armed forces. In this country we are almost resigned to not having enough nurses to go round, and my friend the Enlightened Senior Nurse, who is the despair of her contemporaries, says it all comes of spreading their training over four years. Using modern teaching methods, she says, you could perfectly well train an intelligent girl as a nurse in two years, provided you didn't waste her time and blight her enthusiasm by making her do ward-cleaning and message-running for the first two. Girls (so she says) like nursing, they come into the hospitals all agog to nurse; but for months they are not allowed to perform any serious nursing service for the patients, and they lose their initial velocity. The four-year course, she asserts in her uncompromising way, is a device of the hospitals to get staff; but if girls could qualify in two years far more would be willing to try nursing: they are put off, and rightly, by the thought of four years' incarceration. If

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the course was shorter some girls might even be willing to take a nursing course as a preliminary to marriage; and that might lead to a revival of the old custom (which I personally favour) of getting born, and being ill, and recovering or dying, as the case turns out, in your own bed—a process which should relieve the pressure on hospitals.

I know this is not orthodox. I am suggesting, I know, that we should let loose a lot of half-baked specialists on the community. But a half-baked nurse may also be a half-baked cook, dressmaker, and handymaid—a thoroughly all-round person in fact, worth more than nine out of ten fully-baked specialists. It is all this thorough baking, if I may use the expression, which has browned me off.

* * *

Why stretch the Septuagenarian out flat on a crib 6 × 2 ft. when he is ill or feeble? He certainly isn't happy or comfortable on it and these are the two first requisites of recovery in old age. Women seem to feel differently about it, but then they like bed to read in. Who ever met an old man asking to go to bed! Like the cony he feels the cold if he is spread out. And in bed at best he can only get an even temperature, whereas what the old man craves is radiant heat. The two inspired civil servants who drew up the first coal-rationing scheme had the right idea when they pleaded to let the old man change some of his clothing coupons for extra fuel. All the old man's processes go on more naturally in the sitting position—circulation, digestion, sleep itself, which most old people find refreshing out of bed—and the acts of nature are simplified. It should be possible to devise a toilet settee on to which he could gently slide: what a vista of happiness for those who have the daily bedpan torture to look forward to. I am no technician, but I fancy that the box-spring would be the most comfortable groundwork for the settee and would compare favourably in cost and durability with other materials. Initial cost of the settee would no doubt be considerable, which is a reason for considering it betimes along with the rest of the provision for housing the old which we are now facing. Let us make no mistake at the outset about the type of equipment that is best for them.

* * *

Our medical school has suffered its third and worst bombing. Some time ago a bomb nearly hit the building and blasted off one wall, putting all the laboratories out of action. Not a window, and hardly a door, remains intact, though already library, refectory, and common-rooms are again in use, and the office functioned throughout. There were no fatal casualties and the students, aided by all sections of the staff, have since cleared the place of masonry, rubble, and glass, and have salvaged and cleaned apparatus. They also carried down four flights of stairs (no lift being available) 12 heavy teak dissecting-tables, 100 stools, and 10 "subjects" in coffins. To the alarm of bystanders these were loaded by instalments into the only available transport, a one-horse van, and transported to Another Place, where 92 students resumed their dissections by 9 AM on the fourth day. Laboratory facilities for physiology were afforded elsewhere, and work there was begun on the same morning; and a few days later first-year classes also were in full swing. All of us are deeply grateful for the prompt, generous, and friendly hospitality afforded, and also for the kind offers which we could not accept.

* * *

Here is a letter from a parent to excuse the non-attendance of his son at our refraction clinic.

> SIR,—I am not allowing my son, Norman, to come to you for eye treatment, the reason being the ointment or drops you have given for his eyes has had definitely a detrimental effect. After the first application he complained of not being able to see properly. Thinking that this was perhaps an evasion, I tried some in mine, I have lost in one eye my vision, which was, I was assured at the Eye Infirmary, very good. If my eye does not improve, or the boy's, I intend to have expert advice. I, as a layman, fail to see why vision should be made worse, to have one's eyes tested.—I am, &c.

I should explain that we do warn patients of the effect and purpose of the mydriatic when it is issued.

Letters to the Editor

RETURN TO CIVILIAN MEDICINE

SIR,—My son has been a medical prisoner-of-war in Germany since Dunkirk, working in a large surgical hospital where Allied airmen are treated. I asked his views on the re-education of Service medical officers for civil life, and in reply he tells me that the following conclusions have been reached by the staff of the two hospitals with which he is connected:

1. *Young MO's* should have 3–6 months' lectures covering the main subjects of the final-year course—medicine, surgery, obstetrics, gynæcology, and pædiatrics—with emphasis on the common maladies useful to the general practitioner, and little of biochemistry and pathological rarities. Also a course in therapeutics given by a clinician. The greatest possible use should be made of beds and outpatients for demonstration purposes concurrently. (Use municipal beds.) The course should be free (compare Dominions) and it should be followed by facilities for house-appointments, with preference over the rising generation, and some State aid for those with families.
2. The *older GP* should have a short course of recent advances in the diagnosis and treatment of the commoner maladies, with obstetrics and gynæcology.
3. The *specialists* mostly want 3–6 months' facilities and financial assistance for study in their own specialty, and some ask for 3 months in the United States. The embryo specialists need the same assistance to read for MRCP, or the primary or final fellowship of the RCS. This may sound grasping, but the Dominions are doing all this—see published schemes of New Zealand, Australia, and Canada.

He adds that "all the above categories are represented with us here, and all seem to be impressed with the need for financial aid, of which the war gratuity would form a part."

M D.

*** On another page our Canadian correspondent describes the Canadian proposals.—ED. L.

MENINGITIS FOLLOWING SPINAL ANÆSTHESIA

SIR,—The medical profession is indebted to Dr. Frankis Evans for his paper of Jan. 27 reporting two cases of meningitis following spinal anæsthesia and also for outlining the technique to avoid a recurrence. Many surgeons who gave spinal anæsthetics themselves in the early days have solved the problem of sterility, but some anæsthetists have need to realise the importance of adequate scrubbing-up and minimum touch. Some, in preparing to give a spinal anæsthetic, merely draw back their cuffs, wash for a matter of seconds, and even keep on the ring that they may be wearing; in other words, they need to learn how to scrub up.

In these days of many and varied methods of anæsthesia, such as intra- and extra-dural administrations, local and regional infiltrations, and posterior splanchnics, a high degree of technical skill and asepsis is required of the all-round anæsthetist. Dr. Frankis Evans's article may well be the precursor of an extra condition for candidates for the DA—that besides having held a resident anæsthetist's post they shall have been house-surgeon at a recognised hospital.

In 1935 I had the mortification of losing a patient from meningitis after a spinal anæsthetic. Since then everything connected with the spinal anæsthetic has been boiled in a separate electric steriliser containing distilled water; this includes needles, syringes, and the ampoules of 'Nupercaine.' The materials are then all laid up dry. Nine times out of ten, so-called sterile water is infected; and bacteriologists tell us that there is nothing so good as a wet surface for attracting and spreading infection. Syringes are washed out if necessary—but with some of the anæsthetic agent, out of the boiled ampoule.

With the fine needles now used, preliminary infiltration of the skin with procaine is unnecessary; but should it be considered advisable, then some of the nupercaine, amethocaine, or procaine which will be used for the spinal can be injected.

Each year an appreciable number of people in this country die "respectably" from rinsing instruments in so-called sterile water, or from the use of instruments after being "sterilised" in spirit. I personally have

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seen such a case, and I have heard of more deaths and cases of cellulitis of the arm than I care to recall. It will be a happy day for the British public when we in the medical profession succeed in discontinuing the use of sterile water (except out of ampoules) and of spirit for sterilisation. Spirit is a good preservative of germs; yet both the medical and nursing professions hold on to it faithfully for storage of instruments—a costly fidelity.

The essentials for spinal anæsthesia are to boil everything—needles, syringes, and ampoules—and lay up dry. The area must be towelled adequately with a sterile towel. The lumbar area must be properly prepared. And finally, the administrator must wash up to the elbows for 4–5 minutes and touch as little as possible.

London, W1. HAROLD DODD.

SIR,—Any help in preventing the tragedy of the infected spinal injection must be welcome to surgeons and anæthetists, but I fear that the advice given by Dr. Frankis Evans (Jan. 27) by attempting too much will in fact accomplish little; not only do his five paragraphs of "well-defined rules" obscure the essentials, but many may even be altogether deterred from using this admirable form of analgesia. In brief, the operation consists in the transference of fluid from an ampoule, via the sterile interior of syringe and needle, into the patient's meninges, and the fewer extraneous solutions (such as reputedly sterile saline, and fluid of any sort from a rubber-capped bottle) that touch these vital channels, the better. In my opinion there are four essential rules:

To boil syringe and needle immediately before use.

To wash out the syringe with a little of the anæsthetic solution which is to be injected. The interior of the needle will be irrigated by emerging cerebrospinal fluid when the puncture is made.

To hold the spinal needle in a gauze swab.

To make a preliminary skin puncture with any large serum needle, thus preventing a lump of epidermis becoming impaled upon the spinal stilette.

Other precautions are useful accessories, but if these four cardinal points are observed there need be no hesitation in using spinal analgesia under any conditions which are fit for surgery at all.

BLA. W. G. MILLS.

STRESS FRACTURES OF THE FIRST RIB

SIR,—May I briefly answer the criticism of my paper made by Dr. Blair Hartley in your issue of Jan. 27?

Firstly, my study was based on radiography and personal interrogation of the subjects: Arbuthnot Lane had the advantage of me, as of course none of my cases has as yet come to post-mortem! Secondly, although only 35 cases in a series of 55,451 consecutive fluorograms were recorded, I stated that "not infrequently first ribs were noted to be broadened or to show some departure from the normal architecture near the scalene tubercle"—the site of the undoubted lesion. These cases, had they been recognised and recorded earlier, would surely have increased the incidence of fracture of the first rib to a considerable extent, assuming that such appearances are accepted as the healed lesion. Thirdly, the excerpt from Arbuthnot Lane's paper is hardly relevant, as I recorded that in only 2 of my 35 cases was any history of direct injury obtained, and of these one was so vague as to be of little value.

Hartley's main objection is to my use of the word "stress." I feel certain he does not deny the presence of fracture. Further research into the antecedent history of another 29 cases in my next 26,231 consecutive fluorograms, not one of which even under pressure admitted direct injury, satisfies me that the use of the word "stress" is likely in the majority of cases to be justified. In applying the criteria formulated by Hartley, taking both series of cases, 64 in all, (1) the affected ribs were apparently normal in all other respects, with one possible exception, and no obvious associated congenital abnormality was recorded in the thoracic cage; (2) only 2 cases can be ruled out on the score of direct injury; (3) "sub-threshold stress" is difficult of definition and is very personal, especially when applied to an anatomical mechanism not constantly weight-bearing, or at least not so constantly as the pelvis and lower extremities. But surely the first rib with its intimate muscular association with the shoulder girdle frequently comes under this heading and is therefore equally exposed from time to time to sub-threshold stress, in particular heavy weight-lifting. In this connexion, no less than 6 of the later series of 29 cases give a definite history of lifting and carrying weights of 1 cwt. and over, while one of them was employed for several years in a flour mill carrying 2 cwt. bags of wheat, but whether this can be regarded as a sub-threshold stress is a moot point!

In conclusion, if stress or fatigue fractures can occur in the lower extremities, for no other apparent reason than frequently applied sub-threshold stress, and this is not in doubt, there would appear to be no reason to suppose that a similar condition, especially in the almost monotonous absence of history of injury, is unlikely in the first rib when it is subjected to heavy weight-lifting or for that matter, to any other unaccustomed physical exertion over varying periods of time affecting the shoulder girdle and thereby the first rib.

Chatham. B. ROXBY ALDERSON.

BRACHIAL NEURITIS OR HERNIATED DISC

SIR,—In your issue of Jan. 6 Majors Elliott and Kremer lucidly describe a type of brachial neuritis involving C7 root, and bring forward fairly convincing evidence that it is due to compression of the root by a laterally-placed protrusion of the intervertebral disc between C6 and C7. In the past eighteen months I have seen 20 patients suffering from this condition; and it appears to be a common type of brachial neuritis among Service personnel in this country. All the patients were men except one who was a nursing sister.

The outcome in these 20 cases may be of interest. The acute pain radiating down the arm stopped within five weeks in 16 cases, and within six weeks in 1. In 2 cases there was still pain of decreasing severity after five weeks when they had to be transferred to other hospitals, and 1 patient had fairly severe pain after nine weeks when he was invalided from the Service. When the severe pain has stopped there may still be a minor degree of disability; occasional dull aches in the arm may occur, some weakness of the triceps may persist for some weeks, and dysæsthesia in the index finger may continue for several months. The triceps-jerk can certainly remain absent for many months, and it seems possible that it may remain absent permanently—a finding comparable to the loss of the ankle-jerk in radicular sciatica due to a prolapsed disc or other cause, which may be absent many years after the sciatic pain has stopped. No case of a second attack of severe pain has yet been seen.

These results, without special treatment other than mild analgesics and in the more severe cases rest on the lines described by Elliott and Kremer, suggest that the prognosis of the condition is good and that operative removal of the disc protrusion should very rarely be necessary. The last line of your annotation on the subject (p. 24) is very true.

J. W. ALDREN TURNER.

EXUDATIVE TONSILLITIS

SIR,—The diagnosis of diphtheria in the inoculated cannot be made on clinical grounds alone, nor is a positive throat-swab conclusive for such a diagnosis. As I pointed out in my paper, the *state of immunity* of the patient has to be ascertained, by a Schick test or by an estimation of the antitoxin content in the blood.

In the series of 50 cases which I published, the throat lesion varied between minute spots and large deposits covering the whole tonsil, but virulent diphtheria bacillus and no other organism was found in the throat, and the Schick test was positive in all. The diagnosis of diphtheria cannot be doubted. It is obviously wrong to accept the diagnosis only in those cases which exhibited a severe throat lesion and to repudiate it in those with a small deposit. If the criteria mentioned above be observed it will be found that diphtheria in the inoculated is very rare indeed, and it was found to be less than 1/1000 inoculated in this hospital.

Newcastle-upon-Tyne. C. NEUBAUER.

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REORGANISATION OF THE TUBERCULOSIS SERVICE

SIR,—The report recently issued by the Joint Tuberculosis Council makes a number of excellent recommendations, including the formation of joint boards by small local authorities for tuberculosis services; improvements in the system of notification; closer association of tuberculosis officers and their clinics with the general hospitals; and coördination of the tuberculosis with other public health services in the locality. But there are some serious omissions. In three pages of recommendations, no suggestion is made that social welfare workers—almoners—should be appointed to local services; the education of the general public on tuberculosis is not discussed, nor are problems of staffing sanatoriums with nurses and domestic staff, and of health protection of staff. The report is equally silent about the part to be played in teaching and research by existing or future university departments of tuberculosis or thoracic medicine, the problem of contact examination (so defective at present), and the relation of the tuberculosis service to the industrial medical services in relation to re-employment. Finally, there is no allusion to the future of the nation-wide mass radiography scheme, nor to the financial allowances scheme. The council's views would be particularly valuable on methods of integrating mass radiography with the rest of the service. Their last publication on this subject was in 1941, two years before the scheme was started.

OBSERVER.

CECIL JOLL MEMORIAL FUND

SIR,—We, colleagues and friends of the late Cecil Joll, feel that some recognition of his distinction in the science and practice of surgery should be put on permanent record. This, we suggest, might take the form of an annual lecture or prize essay sponsored by the Royal College of Surgeons of England, as shall be determined by the president and the council, of which Cecil Joll was an active member.

Contributions from all those in sympathy with this object should be sent to the Manager, National Provincial Bank, Marylebone High Street, London, W1, marked "Cecil Joll Memorial Fund."

ELIZABETH BOLTON — JENNER HOSKIN
DANIEL T. DAVIES — CEDRIC LANE-ROBERTS
HORDER — LIONEL E. C. NORBURY

A CHAIR OF PSYCHIATRY

SIR,—The letter of "Service Psychiatrist" in your issue of Feb. 17 raises two important questions. One of these chiefly concerns psychiatrists; the other interests all Service medical officers overseas.

The blinkered outlook revealed by the Goodenough report in its section on psychiatry, and the inadequacy of the policy which it suggests, have caused some dismay to Service psychiatrists overseas, many of whom have by the nature of their work been made to realise with special vividness the need for a well-balanced development of psychiatry after the war. The impending appointment to the University of London chair of psychiatry is of considerable importance in this connexion, and the appointment should therefore be open to the widest possible field of candidates.

A larger issue also arises. The increasing tendency to fill permanent medical positions at home now, while so many of our colleagues are on foreign service, is causing growing concern overseas. In total war danger, discomfort and overwork are, to some extent, shared by all doctors; but it is those on overseas service who have the most grievous burden to bear—separation for periods of years from family and homeland. It is clear that this burden would be more evenly distributed if all fit doctors at present working in the Emergency Medical Service or other civilian employment took their turn of duty with the Armed Forces. Doubtless the possibilities of this proposal are being explored. Meanwhile, at least the making of permanent medical appointments now should be reduced to the absolute minimum. Otherwise resentment will increasingly develop among medical officers overseas, who naturally experience in a rather more acute degree the concern which many of us feel about our professional opportunities after the war.

In discussions about the future of the medical services in this country after the war, the interests of doctors serving overseas have often been piously invoked. The question of the making of permanent appointments is likely to be regarded by medical officers on foreign service as a test of sincerity in the councils of our profession; and the maintenance of "equality of opportunity" in this matter would materially aid cohesion of the profession after the war. It might even help to get the best medical men into the right post-war jobs.

S. A. MACKEITH,
Formerly Adviser in Psychiatry, Allied Force Headquarters.

London, SW1.

SIR,—I trust that those responsible for filling the London chair of psychiatry will bear in mind the positive advantages that might be secured by appointing a Service psychiatrist. By general consent, the psychiatric work carried out in the Services has been excellent, and the new viewpoint in extramural psychiatry will have much to contribute to post-war social medicine, if sponsored by a man with administrative experience of its advantages and limitations.

EMS PSYCHIATRIST.

ABDOMINAL TOPOGRAPHY

SIR,—In their instructive article of Jan. 6 (p. 10) Brown and Smith rightly call attention to the confusion that exists in modern textbooks. They support William Anderson, who, in 1892, ascribed the division of the linea alba into three equal parts to le Clerc in his *Epitome of Surgery*, published in English in 1696.

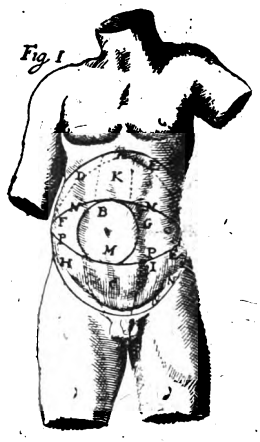
Fig. 1

Glisson's diagram of the regions of the abdomen.

Daniel le Clerc (1652–1728), a practising Swiss physician born at Geneva, published the famous *Bibliotheca Anatomica* at Geneva in 1685, two volumes in folio. As joint editor with le Clerc was Jean Jacques Manget (1652–1742), a most laborious biographer. This compendium consists of a wide selection from the works of the outstanding anatomists of the 17th century, and appropriately starts the anatomical scene with Francis Glisson, Regius Professor of Physic in Cambridge: "Tractatus de partibus continentibus in genere et in specie de iis abdominis." This treatise had been previously printed in Amsterdam in 1676 and in London in 1677. Le Clerc and Manget seized upon it as a worthy opening to their two tomes.

In this article by Glisson occurs the same division of the abdomen into three zones by tripartite division of the linea alba (tab. I, fig. 1). Glisson was at great pains to describe by line and letter the nine regions. The names used are the conventional ones except that the lumbar regions are called right and left epicolic. Thus Brown and Smith are in good company in insisting on the retention of the umbilical region. Embryologically, the umbilicus is the scene of many happenings, and, after all, as Ballantyne said, it is the mouth of the embryo and of the fœtus.

Anatomy School, University of Cambridge. H. A. HARRIS.

PÆDIATRICS OR CHILD HEALTH?

SIR,—I write to put in a plea for the retention of the words "pæditrician" and "pædiatrics." I do so chiefly because these designations have long been established in the universities and hospitals of North and South America and of Europe. When travelling abroad one realises how important it is for us to keep into line with the rest of the world, so as not to expose our teachers and practitioners to the disadvantage of being called by titles which differ from, and often hold a little less dignity than, those of their colleagues. The public, and especially its elective bodies, are now beginning to understand what a

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pædiatrician is, just as they have come to know what a psychiatrist and an orthopædic surgeon are.

The term "child health," though fashionable, is a little like a catch-phrase and is of doubtful composition. Furthermore it does not obviously include infants—a point which those connected with maternity hospitals and infant-welfare centres should note. There is every reason for including in our title the idea of health as well as that of disease, but we should not go too far in our enthusiasm; actually pædiatricians have long based their work on this idea. I suggest therefore that we call the holders of our chairs professors of child health and pædiatrics, or of pædiatrics and child health.

Manchester. C. P. LAPAGE.

ANIMAL LIFE IN DESERTS

SIR,—Any discussion of (climatic) heat leaves most people in England cold; but recent articles show that interest is reviving. The subject is of more than ephemeral interest to persons living or serving in sunny climes such as Persia, Iraq, India, or Burma where the welfare of gallant men is now beginning to gain a modest share of the public ear.

Estimation of heat radiation will be most revealing if the technique described by Evans and Mendelssohn [1] can be applied to working and living conditions when heat radiates from the ground, hills, walls, cloudy skies, vegetation, mechanical bulks, and industrial plant. The ordinary dry-bulb shade thermometer in a meteorological Stevenson's screen is notoriously misleading as a guide to human suffering where heat radiation is excessive, and the new technique will show why.

Ladell, Waterlow, and Hudson [2] demonstrate again the value of urinary chloride estimations, a very sensitive index of "heat effects" as I showed in 1937 [3] and previously. The high blood-urea in normal persons is a commonplace. Loss of body-weight in hot weather is confined to certain individuals: if the experimental group had been larger and had contained well-acclimatised subjects, some cases of gain in body-weight in hot weather would have been recorded. Such cases develop an œdematous "hump" to keep them going between drinks of water, the excess body-weight disappearing with the onset of cool weather. A striking feature of heat exhaustion is the stuporose mental reaction; such patients answer questions at random and appear to grudge—or are unable to afford—the mental effort required for a correct reply. After two or three days' bed rest (they are drowsy most of the time but will take light meals with plenty of water and salt) the patient brightens up and will answer questions willingly, even eagerly, and give a full and accurate history up to the time of his collapse. A cool room for treatment is essential. Ladell and his colleagues remark that "there was no reason for a man to become water-deficient unless he was lazy about drinking." In practice the natural inclinations are no guide to the amount of water necessary. I have often examined dehydrated and salt-lacking men who, in reply to the question, "Why didn't you drink more water?" said "I did not feel the need for it." It is necessary for a man to drink from 12 to 30 pints of water a day to keep in balance, and of course consume equivalent quantities of salt. An unphysiological effort is required, and complaints of acute dyspepsia, attributed to the great volumes of water, are common. There is little doubt that the gastric symptoms *are* due to the water, but there is no other physiological route for water absorption in man.

Ladell, Waterlow, and Hudson advise that men in hot climates should be given a holiday after 8 weeks of hot weather. This policy was actually carried out by the Royal Navy during the war of 1914–18, when they had gunboats on the Tigris; their health resort was in the heights above Colombo, and the results were excellent. No other organisation has had the foresight to provide such reviving spells. No doubt effective air-conditioning would be an efficient remedy, but here again few authorities can overcome the inherent inertia which opposes the adoption of a new idea.

The division of cases of heat exhaustion into types I and II is rather artificial, though very interesting, and does not affect the treatment. Wallace and Bushby [4] describe anoxia and jaundice in their cases of therapeutic hyperthermia. I have used oxygen inhalation, for preference through an improved BLB mask, with success. Jaundice in cases of hyperthermia has been observed during this war but very rarely in peace-time: it seems to develop in unacclimatised persons (the liver is the hottest part of the body) and is probably influenced by vitamin deficiency and an unbalanced diet. The problem of central control (and central failure) of sweating and deficiencies of sweat-glands whether congenital or acquired [5] all point to the necessity for careful selection of men destined for service in the tropics, the necessity for careful acclimatisation of such men before exposure to the most severe heat, and the necessity for air-conditioned quarters, hospitals, and laboratories in centres where men congregate for work or war service in hot countries.

A mild attack of so-called sandfly fever, abortive atypical attacks of paratyphoid or typhoid fever (common in inoculated persons) or even temporary dehydration, will all stop sweating by some central action on the hypothalamus. The course of the case will vary with the facilities for intelligent help available to the sufferer.

FRANK MARSH,
Pathologist, Anglo-Iranian Oil Co., Persia.

RETURN OF BLOOD TO THE HEART

SIR,—In Dr. Roberts's paper of Feb. 17 I was particularly interested in the section on venous valves. I feel that if the "muscle pump" theory is to be questioned, the precise functions of the venous valves should be agreed upon.

Dr. Roberts points out that Harvey stipulated that the valves exist to ensure that blood entering a main channel from a tributary must move towards the heart, and that the valves have nothing to do with gravity. This statement is supported by the anatomical distribution of the valves, which in the extremities are usually found just distal to where a tributary joins a main trunk. This distribution is far more abundant in the extremities than elsewhere in the body, not because of the requirements of gravity but in order that the flow will be in one direction. For it is in these parts that centrifugal forces may come to have bearing on the venous return, and if the veins were devoid of valves, back-flow and venous collapse would undoubtedly occur.

Another example is seen in the veins of the neck, where the valves are usually situated at the inferior end of all veins running down into the large venous channels just above the right heart. The external jugular vein has a pair of valves where it enters the subclavian, and another pair about 1½ in. above the clavicle. The internal jugular vein has no valves in the base of the neck, but it has a pair just cephalad to the inferior bulb. Where the vertebral enters the innominate a pair of valves guard the entrance, as in the case of all other small veins in this region. Thus any back-pressure waves resulting from auricular systole will be dissipated and continuity of one-way flow ensured.

I have cited two examples of the functions of venous valves in support of Dr. Roberts's view that they play no part in the return of blood to the heart, when used together with the muscles to form the "muscle pump." Further, these two examples show that a very important function of the valves, if not their most important function, is to ensure, together with other factors, that a one-way flow of venous blood back to the heart will take place irrespective of muscular contraction.

St. Mary's Hospital Medical School, London, W2. G. H. BULOW.

SIR,—As a preliminary to an intravenous injection, it is customary to apply a tourniquet to the upper arm at a pressure above the venous and below the arterial. If from this alone the veins do not stand out well, one instructs the patient to clench and unclench his fist four or five times, whereupon the veins become further distended. (To clench the fist once and hold it clenched,

1. Evans, D. S., Mendelssohn, K. *Brit. med. J.* 1944, ii, 811.
2. Ladell, W. S. S., Waterlow, J. C., Hudson, M. F. *Lancet*, 1944, ii, 491, 527.
3. Marsh, F. British Encyclopædia of Medical Practice, 1937, vol. VI., p. 396.
4. Wallace, J., Bushby, S. R. M. *Lancet*, 1944, ii, 459.
5. Fog, M. (complete loss of capacity to sweat, following paratyphoid fever) *J. Amer. med. Ass.* 1936, **107**, 2040. Quoted by *Brit. med. J.* 1937, i, 621.

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as patients sometimes do on their own account or on a nurse's instructions, does not have the same effect.)

This fact, so familiar to all house-physicians, is fully explained by "the theory of the pumping action of the muscles." Can Dr. Roberts provide an alternative explanation?

Maida Vale Hospital for Nervous Diseases, London, W9. W. J. PENMAN.

MEDICAL STAFF COMMITTEES IN MUNICIPAL HOSPITALS

SIR,—I was much interested in the views of Mr. Somerville Hastings as published in your issue of Jan. 20. Of special importance to those working full-time in municipal hospitals are his remarks on the extent to which the medical staff should be able to influence the administration of a hospital.

It is evident that Mr. Hastings has in mind a much more democratic method of administration than is the custom in the county council of which he is chairman, and in which medical staff committees are certainly not the rule. Such committees are indeed the exception all over the country; yet, until they are formed, the present dictatorial regime of the medical superintendent (often of advanced years) will continue in local-authority hospitals.

The medical staff committee (consisting, apart from the medical superintendent, of the heads of the medical, surgical, and obstetric departments, as well as of any special units the hospital may possess) should in my opinion be an integral part of the administrative structure of all hospitals. These men are in charge of all clinical work, and their ideas and suggestions for a more efficient service will often be considerably more realistic than those of some medical superintendents, who are above all administrators. There should also be an obligation on the medical superintendent to convey the views of this committee to his local authority, possibly with his own comments. I feel sure that medical officers would do their work with greater concentration and enthusiasm if they knew they had a share in the efficient running of the hospital, as well as a chance of making their views known at the local county hall.

ASSISTANT MEDICAL OFFICER.

AN IMPROVED "BP"

SIR,—Since the publication of the *British Pharmacopœia* in 1932, no less than six addenda have been issued, and we now receive a seventh. Thus the doctor has seven books to consult for information about official drugs, and even then his information must be amplified from other sources. It is true that some of the alterations in the earlier addenda, which were due to shortage of ingredients of some compound medicines, have been cancelled in later ones, after experience which has not always been happy, but this has chiefly been in respect of medicaments for external use, and such as are perhaps of minor importance.

An outstanding function of the *BP*, shown particularly in the Seventh Addendum, is to give official sanction to, and adequate standards for, at least some of the many potent drugs which are constantly being added to the list of agents recommended for the use of physicians. Of these probably the most potent, and if wrongly used the most toxic, are the sulphonamides, a term which has unfortunately passed into current speech, generally in a mutilated form. But the chemical structure of these bodies can only be understood by competent organic chemists, and their pharmacology is only gradually being worked out. One of them was made official in the Fourth Addendum and nine more are now added in the Seventh. Full chemical information is given concerning these and also tests for identity and purity, but we are told nothing about their pharmacology or therapeutics, except in a statement of the range of doses which are normally safe, and those, somewhat strangely, are uniform throughout, although the substances differ widely in solubility, potency, and toxicity.

We are confronted with the convention—it can be little more—that no notes on pharmacology or therapeutics shall be included in the *British Pharmacopœia*. This was doubtless satisfactory when medicinal agents were either of well-known vegetable origin or simple inorganic salts from the earth, but now that the organic chemists produce a continuous spate of synthetic drugs this policy might well be reconsidered. I understand that in the forthcoming revision of the *United States Pharmacopœia* it has been suggested that all active medicinal agents included should be classified in accordance with their therapeutic actions. There seems to be nothing in the relevant Acts of Parliament to prevent similar or kindred action being taken in this country. The Medical Acts of 1858 and 1862 provide that the General Medical Council shall cause to be published a book containing a list of medicines and compounds and the manner of preparing them, together with the true weights and measures by which they are to be prepared and mixed, and containing *such other matter and things relating thereto as the General Council shall think fit*, to be called *The British Pharmacopœia*. The enabling words, which I have italicised, seem to justify the GMC in breaking the convention. Medical men should not be driven to rely on extra-official works or the ex-parte statements of manufacturers as their sole sources of information concerning the action of drugs.

Exeter. H. WIPPELL GADD.

*** The Seventh Addendum became official on Feb. 1, 1945.—ED. L.

ALKALI FOR CRUSH INJURIES.—In their letter of Feb. 17 Professor Maegraith and Dr. Havard mention a misprint in the second edition of the Medical Research Council's War Memorandum No. 1 *The Treatment of "Wound Shock,"* by which the equivalent of 7 grammes (of sodium bicarbonate) was stated as 2 ounces instead of about 2 drachms. We understand that the mistake, which arose from the printer's misinterpretation of the conventional signs used in the manuscript, was noticed immediately after publication, and that an erratum-slip was inserted in all accessible copies.

Parliament

FROM THE PRESS GALLERY

New Housing Policy

IN the House of Commons on Feb. 23 Mr. DUNCAN SANDYS, Minister of Works, stated that the Government had decided in the interests of economy and of town planning to change over as soon as was practicable to the construction of permanent houses which could be built on normal sites and which would not need to be pulled down in a few years' time. He hoped to make a further statement to the House about the method and timing of this change-over. Meanwhile he had thought it right to ask the manufacturers of temporary houses not to enter into any further long-term commitments beyond what would be required for the next 9 to 12 months' production. Should it become evident that for any reason the start of permanent house building was likely to be delayed, it would be possible, providing that sufficient notice was given, to place continuation orders for temporary houses for a further period. However, in order that there should be no misunderstanding, he wished to make it quite clear that until such time as the permanent house building programme could be got well under way the Government intended to press forward with the manufacture of temporary bungalows to the fullest possible extent. The rate of production would be limited only by the supply of labour, materials, and factory capacity. He hoped that local authorities would continue to press ahead energetically with the preparation of sites in accordance with the programme which was being issued to them by the Minister of Health and the Secretary of State for Scotland. The types of temporary bungalows to which he had referred did not include the pressed steel house. Since it could not come into production on any appreciable scale during the next 12 months he had felt it necessary to reconsider the position in regard to that type. Among other alternatives he was examining with the manufacturers the possibility of substituting a pressed steel two-storey house of permanent construction in place of the temporary bungalow. He was glad to be able to announce that deliveries of temporary houses during the second half of this year would include a substantial number from America. A mission had been sent to Washington to

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discuss design and other technical questions and the United States government had generously declared their readiness to send us some 30,000 of these temporary houses. They would be similar in size to the standard British bungalow.

Mr. A. GREENWOOD said this was a definite change of policy. There could be no separation of the temporary from the permanent problem. The House was apprehensive about the housing situation and would require an early debate, and Mr. E. SHINWELL asked for an assurance that these proposals would not be put into operation until the House had had an opportunity to debate them.

Mr. A. EDEN, as Leader of the House, said he did not think anybody would want to hold up the work. A debate would be arranged as soon as possible. Later Captain E. C. COBB and a number of other members gave notice of a motion to the effect that the House "views with concern the failure of the Government to announce a definite programme of house building and calls for the use of all possible measures to speed up the production of both temporary and permanent houses."

New Water Bill

In moving the second reading of the Water Bill (*Lancet*, Feb. 10, p. 190) on Feb. 21 Mr. WILLINK, Minister of Health, said that Parliament had already passed legislation for the extension of public water-supplies and sewerage in rural localities, and he hoped in the course of this session to introduce a measure for the proper management of rivers. The present Bill was concerned with the conservation and better utilisation of the country's water resources, and the improvement of the administration of water-supplies. There had come into existence two main but dissimilar types of water undertakers—those which operated under special Acts, and those that operated under the public-health Acts. This duality had given rise to an unsatisfactory situation in the general state of the law. The new Bill enabled all the special Act undertakers to do certain things with the Minister's consent which public-health Act undertakers could do already, with Ministerial consent, without the need for special legislation. By this assimilation the Bill gave default powers to the Minister in respect of the special Act authorities which he already possessed against the public-health undertakers. The Bill also contained powers and obligations for safeguarding our water resources, securing their proper use, and extending the benefit of piped supplies. There was power to secure, by compulsion if need be, a combination of undertakings. There was also a tightening up of provisions against waste, misuse, or pollution of water. Summing up, Mr. Willink said that he believed that the changes which the Bill made were the minimum necessary for speed, efficiency, and economy combined with adequate safeguards. The demand for water was increasing, and in this very important service we needed more integration, more flexibility, and above all more informed planning. We should not be blind to the fact that a third of the houses in our countryside were still without a piped water-supply.

Mr. ALEXANDER WALKDEN asked for the reorganisation of our catchment boards, and regretted that responsibility for water was to be divided between the ministers of health and agriculture. There should be a National Water Commission with the power and duty to act continuously. Mr. T. LEVY thought that the country did not want plans and blue-prints; but a proper water supply. The only way to tackle the problem was to divide the country into water regions, each with its authority armed with adequate powers to develop and coördinate the water services with appropriate State supervision, backing, and credit.

Mr. WOOTTON-DAVIES urged that if chlorine was to be put into water some limit should be put on the amount, and trained chemical control should be provided to ensure that the amount was not exceeded. As a chemist he held that there was danger in using chlorine in water which passed through lead pipes and brass taps. Moreover, this Bill allowed wells to be sunk to a lesser depth than 50 ft. In small doses arsenic was a good tonic, but like lead it was cumulative poison. He feared that arsenic used to wash sheep got into somebody's water-supply, and he asked the Government to take special powers to control the way in which sheep were dipped. Hard water was a waster of soap and textiles; there was no reason why this country should not have soft water.

Mr. CLEMENT DAVIES had seen dozens of medical officers' reports condemning water-supplies yet nothing had been done. This to a large extent was a re-enactment Bill with a little more power taken here and there. The Government should go in for a really national water policy and cover the whole field. But Miss F. HORSBRUGH replying to the debate, thought that the Minister was taking sweeping powers. Members said that they wanted the Minister to take more powers, but they did not make it clear what those powers should be.

QUESTION TIME

Hospital Food

Sir E. GRAHAM-LITTLE asked the Minister of Health whether he was aware that in certain EMS hospitals under the management of county councils a system prevailed whereby the steward benefits personally by keeping the expenses below a certain figure, and that this led to reducing the standard of food supplied to resident medical staff and patients.—Mr. H. WILLINK replied: I have no evidence of the existence of this.

Relief for Poland

Captain ALAN GRAHAM asked the Secretary of State for Foreign Affairs what arrangements had been made either by the Soviet Government, the International Red Cross, or UNRRA for the provision of at least as much food, clothing, and medical supplies as was possible under the German occupation to the remaining 700,000 of the former population of Warsaw.—Mr. A. EDEN replied: I understand that relief is being supplied to Poland by the Soviet government, but I am not in a position to make a statement on the quantities involved. Relief taken to Poland by the International Red Cross Committee during the later stages of the German occupation was increasingly hampered by the interruption of communications, and has now been brought to a stop by the development of an active battlefront between Switzerland and Poland. UNRRA has for some time been preparing food, clothing, and medical supplies for despatch to Poland, and the first ship of supplies is loading now. It is expected that shipments will be made on an increased scale as additional port facilities and means of overland transport in Eastern Europe become available.

CHILDREN AWAITING SANATORIUM TREATMENT.—Mr. WILLINK said that returns from local authorities on Dec. 31 showed that 436 children in England and 112 in Wales were awaiting institutional treatment for pulmonary or non-pulmonary tuberculosis.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED FEB. 17

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1497; whooping-cough, 1530; diphtheria, 427; paratyphoid, 1; typhoid, 11; measles (excluding rubella), 19,167; pneumonia (primary or influenzal), 1206; puerperal pyrexia, 149; cerebrospinal fever, 73; poliomyelitis, 1; polio-encephalitis, 0; encephalitis lethargica, 0; dysentery, 357; ophthalmia neonatorum, 53. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Feb. 14 was 1093. During the previous week the following cases were admitted: scarlet fever, 38; diphtheria, 23; measles, 127; whooping-cough, 25.

Deaths.—In 126 great towns there were no deaths from enteric fever, 2 (0) from scarlet fever, 16 (1) from measles, 14 (2) from whooping-cough, 9 (0) from diphtheria, 62 (8) from diarrhœa and enteritis under two years, and 55 (11) from influenza. The figures in parentheses are those for London itself.

There was 1 death from an enteric fever in Greater London. Birmingham reported 14 fatal cases of diarrhœa.

The number of stillbirths notified during the week was 210 (corresponding to a rate of 30 per thousand total births), including 13 in London.

MOH FEVER HOSPITAL GROUP.—A meeting will be held at the London School of Hygiene, Keppel Street, WC1, on Friday, March 9, at 3 PM, when Prof. Arnold Sorsby will open a discussion on the epidemiology and treatment of some eye infections.

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Obituary

FREDERICK WILLIAM EURICH

MD EDIN.

Dr. Eurich, who died on Feb. 16 at his home near Southampton, was professor of forensic medicine in the University of Leeds from 1908 to 1932, and was a leading authority on anthrax.

He was born in 1867 at Chemnitz in Germany, but was educated at Bradford Grammar School and the University of Edinburgh. After qualifying in 1891 he went back to Germany and studied at Heidelberg, Berlin, and Frankfort-on-Main. He then spent several years at the Lancashire County Asylum at Whittingham, latterly as pathologist, and contributed to *Brain* and the *Journal of Anatomy and Physiology* a series of studies of neuroglia. He joined the staff of the Bradford Royal Infirmary, first as assistant physician, in 1898, and soon afterwards he was appointed assistant surgeon to the Bradford Royal Eye and Ear Hospital. His interest, however, lay largely in pathology, and he became bacteriologist to the city of Bradford in 1901 and to the Anthrax Investigation Board for Bradford and District in 1905. Having been made demonstrator in toxicology at Leeds in 1902, he was elected to the chair of forensic medicine six years later. He was an admirable teacher, and the course which he gave of 40 lectures and demonstrations was a notable one. In the preparation of his subject matter he always took great pains, and no class in the school of medicine was better attended. On his retirement he was appointed professor emeritus.

Press Portrait Bureau

Eurich's chief claim to fame, however, is his work on anthrax. He had a greater experience of this disease than any other man in this country. He conducted the post-mortem examinations of all the anthrax cases in the Bradford area and these were at one time very numerous. The institution of the Government Disinfecting Station at Liverpool was largely due to his initiative and energy, and he was personally responsible for much of the control bacteriological investigation carried out in connexion with this scheme. The value of his services to the woollen trade of Bradford through the control of anthrax received full recognition, as shown by the award of the Textile Institute's gold medal. The Home Office appointed him specialist medical referee on anthrax and on poisoning by aniline and lead.

In addition he was in practice as a consulting physician in Bradford for a long period of years, becoming in due course physician and consulting physician to the Royal Infirmary. He was also for many years hon. pathologist there. Conscientiousness in everything he undertook was his outstanding characteristic. He was a sound physician with a particular flair for nervous diseases, and his services were greatly appreciated by practitioners. The amount of work that he did without hope or expectation of financial reward was exceptional; indeed for many years he conducted a free clinic on Saturday afternoons for patients who could not afford a fee and who were referred to him by Bradford doctors. When finally he retired from practice and went to live in Hampshire a dinner was organised in his honour and was attended by many professional colleagues, civic personages, and leaders of industry in Bradford, Leeds, and elsewhere. Remarkable tributes were paid on that occasion to the value of his services to the community.

Professor Eurich married M. G. Carter-Squire, and they had two sons and three daughters. His son Richard has already made a name for himself. He is an Admiralty artist, and his large canvas *Antwerp* was purchased last year by the Chantrey Bequest.

HAROLD MASON LEETE

M D, B HY, DURH., D P H

Dr. Leete, superintendent of the Hull City Hospital, died after a short illness on Feb. 15 at the age of 50. Educated at St. Bees School and the University of Durham, he graduated MB in 1917. He held house-appointments at the Royal Victoria Hospital, Newcastle-on-Tyne, but he had already chosen public health as his specialty and after obtaining his DPH and B Hy at Durham in 1918 he was appointed senior medical assistant and bacteriologist at the Edinburgh City Hospital for Infectious Diseases. Here he undertook the investigation into the reliability of the Schick test and its suitability for general and hospital practice which was later published in our columns (1920, i, 192) and which was the first English paper on the subject. In 1920 he joined the staff of the public health department of Birkenhead, and much of his time there was spent studying the bacteriology of tuberculosis. His MD thesis in 1921 dealt with respiratory disease, and his interest in the diagnosis and treatment of infections was constant. His carefully prepared and concisely expressed reports were widely read: in 1924 with a colleague he described the Birkenhead outbreak of typhus, and since he moved to Hull in 1930 his work on the incidence of diphtheria gravis in that city has been an important contribution to the epidemiology of the disease. An expert clinician, a skilled bacteriologist, and an able administrator, Leete proved himself an admirable superintendent. His patients—and especially the children—loved him, and his clinical demonstrations were thronged. His only son was killed while serving with the RAF in North Africa, and he leaves his widow with one daughter.

JOHN ROBERT WALKER

M R C S, L S A

Dr. J. R. Walker, who died at Hove on Feb. 3 some six weeks after his 99th birthday, qualified MRCS from St. Mary's Hospital in 1868 and had served as a surgeon with the International Ambulance during the Franco-German war. He was awarded the German war medal and ribbon for his services in the campaign and he also held the medal and diploma of the French Society of Aid for Sick and Wounded. He settled in practice in St. John's Wood, but with the British Red Cross Society he continued his valuable work for the wounded and as the eldest surgeon of the society lately received a letter of congratulation from the Duke of Gloucester. After Dr. Walker's retirement he lived for many years at Tunbridge Wells and he was buried there.

JOHN CRIMMIN

VC, CB, C I E, L R C P I, LATE IMS

Colonel John Crimmin, who died at his home at Wells on Feb. 20 at the age of 85, received the VC from Queen Victoria for his bravery while serving as a surgeon with the Bombay Medical Service in 1889. In the official citation an officer of the Mounted Infantry, to which Crimmin was attached, relates how "in the action near Lwekaw, Eastern Karenni, on Jan. 1 last, four men charged with him into the midst of a large body of the enemy who were moving off from the Karen left flank, and two men fell to the ground wounded. He saw Surgeon Crimmin attending one of the men about 200 yards to the rear. Karens were round the party in every direction, and he saw several fire at Surgeon Crimmin and the wounded man. A sepoy then galloped up to Surgeon Crimmin, and the latter joined the fighting line which then came up. Shortly afterwards they were engaged in driving the enemy from small clumps of trees and bamboo, in which the Karens took shelter. Near one of these clumps he saw Surgeon Crimmin attending a wounded man. Several Karens rushed out at him. Surgeon Crimmin thrust his sword through one of them and attacked a second: a third Karen then dropped from the fire of a sepoy, upon which the remaining Karens fled."

Crimmin qualified in 1882 and entered the IMS the same year. Besides joining the Burmese expedition of 1886–89 he saw active service during the last war on the

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North West Frontier while acting as assistant director of medical services in India. From 1916 till he retired in 1919 he was honorary physician to the King. Colonel Crimmin had three daughters and two sons, one an officer in the Indian Army, and the other, Lieut.-Colonel George Crimmin, in the RAMC.

GUSTAV SINGER

MD

Professor Singer, who died in London last December in his 76th year, held for three decades, from 1905 to 1935, the post of chief physician of the medical department of the famous Rudolf Hospital in Vienna where he taught and inspired a great number of pupils. He will be chiefly remembered perhaps for his work on acute rheumatism. He showed vision in realising the significance of this disease, and in suspecting—almost half a century ago—its association with streptococcal infection entering the body through diseased tonsils. This led him to recommend tonsillectomy for prevention and cure. He also introduced silver preparations as remedies for the treatment of rheumatism. During the flood-tide of appendix operations he earned merit by describing a type of "pseudo-appendicitis," and the number of unnecessary operations was much reduced by his endeavours. Later his description of the syndrome of spastic constipation, and his studies on this subject in collaboration with Holzknecht, gained general recognition, and this type of constipation became known as ths Singer-Holzknecht type. A method which has been widely adopted for the conservative treatment of pulmonary abscesses and for combating chronic purulent diseases of the lungs and bronchi was also first used by him; it is Singer's so-called thirst cure. Though his "non-specific irritants therapy" for diabetes did not receive the recognition desired by its author, his idea that for every form of treatment, and in particular for the treatment of diabetes, a special system of welfare is required has promoted the establishment of welfare and consulting centres in Austria and abroad.

Births, Marriages, and Deaths

BIRTHS

CONWAY.—On Feb. 16, at Poole, the wife of Flight-Lieutenant D. J. Conway, MB, RAFVR—a son.

ELVINS.—On Feb. 21, at Khartoum, the wife of Dr. F. G. Elvins, Sudan Medical Service—a daughter.

HARRINGTON.—On Feb. 21, at Farnham, Surrey, the wife of Captain A. W. Harrington, RAMC—a son.

LEWIS.—On Feb. 18, at Gayton, Norfolk, the wife of Captain A. A. G. Lewis, RAMC—a son.

MAYCOCK.—On Feb. 17, at Bristol, the wife of Major W. D'A. Maycock—a son.

MILLAR.—On Feb. 23, at Tynemouth, Northumberland, to Elbea (née Beatton), wife of Surgeon Lieut.-Commander A. McL. Millar—a son.

MOWAT.—On Feb. 18, the wife of Mr. Allan Mowat, FRCS, of Mulajo, Kampala, Uganda—a daughter.

ROYSTON.—On Feb. 20, in Edinburgh, the wife of Major G. Riddell Royston, RAMC—a son.

SWEET.—On Feb. 18, at Oxted, the wife of Dr. R. Douglas Sweet, RAF—a son.

STANBURY.—On Jan. 18, at Colwyn Bay, the wife of Captain S. W. Stanbury, RAMC—a daughter.

SZEKULESZ.—On Feb. 13, at Liverpool, the wife of Lieut. G. SZEKULESZ, RAMC—a son.

TISDALL.—On Feb. 18, at Carshalton, the wife of Dr. G. E. H. Tisdall—a son.

WATLING.—On Feb. 20, the wife of Dr. J. D. S. Watling, New Barnet—a daughter.

MARRIAGES

COXON—BOWEN.—On Dec. 1, in India, Victor Coxon, MD, major RAMC, to Mary Bowen, MB, captain RAMC.

DAVIS—CONQUEST.—On Feb. 17, at Milford, Surrey, John Marshall Davis, MB, to Rosamund Conquest.

STAMM—HAMILTON-MILLER.—On Feb. 15, in London, Temple Theodore Stamm, FRCS, to Pamela Hamilton-Miller.

DEATHS

AVELING.—On Feb. 24, at Chatham, Charles James Aveling, MRCS, surgeon captain RN.

CLARKE.—On Feb. 21, at Leicester, Astley Vavasour Clarke, MD CAMB., DL, JP.

CRIMMIN.—On Feb. 20, at Wells, Somerset, John Crimmin, VC, CB, CIE, LRCPI, colonel IMS (retd.), aged 85.

DUDLEY.—On Feb. 13, at Newton Abbot, Francis Dudley, LRCPI, late medical superintendent, County Mental Hospital, Cornwall.

LEETE.—On Feb. 15, at Cottingham, E. Yorks, Harold Mason Leete, MD DURH., aged 50.

NICHOLSON.—On Feb. 19, at Newton Stewart, Wigtownshire, Benjamin Hugh Nicholson, MB EDIN, formerly of Colchester, aged 85.

O'DRISCOLL.—On Jan. 29, Jeremiah O'Driscoll, MD NUI.

On Active Service

CASUALTIES

KILLED IN ACTION

Captain M. D. M. BERGIN, MB DUBL., RAMC

Captain ARCHIBALD MENZIES OGILVIE, MB CAMB., RAMC

ACCIDENTALLY KILLED

Lieut.-Colonel MAURICE BAYLIS KING, MC, MB DUBL., RAMC

WOUNDED

Lieutenant R. A. GREEN, RAMC

AWARDS

MC

Captain J. W. R. BATTRAM, RAMC

Between Nov. 16, 1943, and May 15, 1944, Captain Battram has been MO to a battalion on the Burma front. During this time his untiring care of the sick and wounded, under all conditions, has been beyond praise. He has never given a thought for his personal safety and has carried out his work on many occasions under enemy-fire with great calmness, courage, and skill. On Feb. 16, 1944, he was with the battalion, less two companies, in an attack near Ngakyedauk. His work was outstanding, and he dealt with and evacuated about 35 wounded under considerable fire. Only one of these died of wounds later. On March 25, he was again in action in the Wet Valley, where his work and devotion to duty was again outstanding. On April 7 he accompanied the battalion in an attack on features named Spit and Polish near Dongyaung. He opened the regimental aid-post at the foot of the hills and carried out his duties of collecting, attending to, and evacuating wounded, at all times exposed to enemy fire. On this occasion he successfully treated and evacuated 38 wounded under the most difficult and trying conditions. He remained with the companies during the 36 hours before relief, dealing with, and evacuating, casualties as they occurred. Captain Battram's behaviour in action has, at all times, been exemplary, and his cheerfulness and willing acceptance of danger and discomfort, a fine example to all. He very deservedly has the complete confidence of all ranks of the battalion which is of the utmost value in maintaining a very high morale.

Lieutenant K. C. STEPHENSON, RAMC

Lieutenant Stephenson was detailed to organise the evacuation of casualties from the regimental aid-post of the London Scottish, on the night of Sept. 6, 1944. The regimental aid-post was sited East of Croce and 400 yd. off the road. Ambulance cars could not come within ½ mile of it as the tracks were impassable and under enemy observation. The whole area soon came under intense shell and mortar fire, so much that some men were forced to take cover for hours on end. These conditions continued throughout Sept. 7. In spite of this Stephenson himself organised the route of evacuation and went continuously into the most intensely shelled areas which were also covered by 3 spandau posts, one of which gave itself up to him. He refused to allow the evacuation of casualties to be slowed up, nor would he take any cover himself, but supervised the whole route regardless of personal danger. At another time he went through heavy shell fire to the aid of a man trapped in a "brewed up" tank, but to no avail as the man was dead. He did not cease his untiring work until the regimental aid-post was clear and he was ordered back by his company commander. He also repeatedly visited the regimental aid-post of the London Irish Rifles to make sure that evacuation was efficient. By his fearless courage he kept the post clear of casualties thereby saving many lives and giving an example of leadership which was in the best tradition of the British Army.

MENTIONED IN DESPATCHES.

Brigadier J. M. TWHIGG, DSO, MD, NZMF

Appointments

ATKINSON, E. A., MB LOND.: temp. pathologist and asst. MO at Oldchurch County Hospital, Romford.

FLEMING, R. A., MB DURH., FRCSE: orthopædic RSO at Hexham Emergency Hospital.

WILLIAMSON, GEOFFREY, MD MANC., DPM: medical superintendent at the County Mental Hospital, Rainhill, Lancs.

Colonial Service.—The following appointments are announced:

SUTHERLAND, E. S., LRCPE: AMO Jamaica;

HOWAT, C. H., MB EDIN., FRCSE, DTM & H: senior MO (Surgeon Specialist), Cyprus;

LOUW, G., MB EDIN., DTM & H: senior MO, Uganda;

MACLENNAN, N. M., MD ABERD., DPH, DTM & H: DMS, Kenya;

WILKIN, B. O., MB EDIN., DPH: senior MO, Tanganyika.

PENICILLIN BY MOUTH.—Raymond L. Libby, of the American Cyanamid Company, claims successful results in animals and patients with penicillin given by mouth in pills. The pills are said to be coated with gelatin and to contain penicillin suspended in vegetable or mineral oil. At room temperature they are said to keep for months without loss of potency. Hitherto the difficulty, as was mentioned in our leading article of Feb. 17, has been to devise a coating which can be trusted to dissolve at the right time and place in the alimentary tract. No detailed information about the pills has yet reached this country.

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Notes and News

THE UNPROTECTED CHILD

A NEW pamphlet (*Whose Children?* Simpkin Marshall. Pp. 32. 1*s.*) is the outcome of a correspondence begun by Lady Allen of Hurtwood in the *Times* last July, calling for a public inquiry into the needs of children who are deprived of normal home life and fall to the care of a public authority or benevolent institution. She quotes from this correspondence and from private letters from men and women who were brought up in, or connected with, such homes. Some of the writers state their facts sentimentally and with evident prejudice; but it is significant that many of them tell how bitter were their feelings as "deprived children." Lady Allen quotes Susan Isaacs's remark that "institutional life as such is terribly impoverishing to the spirit." That important point cannot be too often repeated. The child requires an individual and personal background of love and nurture in order to undergo normal development, and this will never be achieved until we are prepared to ensure reasonable standards of knowledge and training in those undertaking the care of children deprived of their own homes. This is a propitious moment to concentrate public attention on the problem, for evacuation has taught the country many lessons, and some constructive solutions, and public feeling is alert as never before to the fate of these dependent children.

The Government announced on Feb. 22 the appointment of a committee to inquire into the provision made for children deprived of a normal home life. The chairman is Miss Myra Curtis (principal of Newnham College, Cambridge), and the 16 members, of whom 8 are women, include Mr. Somerville Hastings, FRCS, and Prof. J. C. Spence, FRCP.

A SHORTER NURSING CONTRACT

VAD nurses and nursing auxiliaries have always felt some resentment because their nursing experience, which in wartime may be considerable, is not taken into account when they wish to enter for a full nursing training course. They have always been required to go through the full four years' course. Lately the Ministry of Health requested authorities to remit part of the period of training for such women. The General Nursing Council have stated their opinion that it would be unwise to shorten the period of training in such cases, but they have suggested that authorities of general training schools which offer girls a four-year contract might remit some time to suitable auxiliaries and VADs in their fourth year, after they have become State-registered. The LCC has decided to put this proposal into effect, and has arranged that special groups shall be accepted for a three-year course of training in general nursing, at first-, second- and third-year salary rates, provided they have had two years' recent full-time nursing service in approved training schools or other hospitals of similar standing. The groups affected are:

Untrained members of the Civil Nursing Reserve (assistant nurses and nursing auxiliaries).

VAD nurses (members of the British Red Cross Society and the St. John Ambulance Brigade).

Nurses in or outside the LCC service who hold the certificate of the Tuberculosis Association.

A SEMINOLOGICAL LABORATORY

GROWING numbers of women attending "family planning" centres seek advice on the treatment of sterility. The subfertility committee of the Family Planning Association has been working to establish a seminological laboratory and clinic in London, and the annual report of the association [1] announces that such a clinic has now been opened at 33, Wimpole Street, W1, in charge of Dr. H. J. Davidson. Studies in seminology have been carried on, in connexion with the Exeter clinic, by Mrs. Clare Harvey, and work at the London laboratory is expected to develop along similar lines. Workers on sterility have always been hampered by differences in methods of examining semen, which make it impossible to compare results from different centres. Mrs. Harvey's aim has been to evolve a standard technique, which should overcome this difficulty. If, as the Association intends, it becomes possible to open laboratories in other parts of the country, a large body of comparable data should soon be collected for study. The London laboratory will undertake investigations for clinic patients at specially low rates. Its services are also available for private practitioners who wish to have cases investigated.

1. Fourteenth Annual Report, 1944. Obtainable from the Secretary, 69, Eccleston Square, London, SW1.

WOMEN DOCTORS IN THE RED ARMY

AT the end of last year Major G. K. Thornton, RAMC, toured Red Army medical units on one of the fronts. Describing his visit in the Medical Women's Federation *Quarterly Review* for January, he says that though he knew many women doctors were serving in the army he was surprised at the number he met in the battle area. A few kilometres from the front, in the *medsanbats*, which are something like our field ambulance but undertake more surgery, there are usually some women doctors. Nursing sisters and women orderlies also serve in these units, and at the battalion medical posts women stretcher-bearers, though rare, are not unknown. In hospitals a little further back there are still more women doctors, and in a small field hospital which Thornton inspected all the MOs were women. The *nachalnik*, or administrative commander, who was the only man on the medical staff, on being asked the proportion of medical women in the forward area replied: "There are no statistics, as the matter is of no interest to us." Some of the wounded are women who have volunteered as snipers. On the whole Major Thornton considers that in Russia women are accepted as standing equal with men on any job they can do—an ideal of sex equality, but he wonders whether all Western women would appreciate it.

University of Manchester

Dr. R. E. Lane has been appointed to the chair of industrial health, for whose establishment the Nuffield Foundation lately made a grant of £70,000. He is likely to take up his duties next September.

Dr. Lane served with the Royal Flying Corps from 1915 to 1919, and qualified in 1923 from Guy's Hospital, where he held house-appointments. During two years' general practice in Nottingham he took his MRCP, and at the end of 1927 he went to Manchester to take up a post with the Chloride Electrical Storage Company, primarily to investigate lead-poisoning. Later the scope of his work was broadened to include associated companies. He was appointed hon. assistant physician to Salford Royal Hospital in 1934, and full physician in 1941. He was one of the founders of the Association of Industrial Medical Officers in 1935, and its chairman in 1940 and 1941. From 1936 to 1941 Dr. Lane served on the Industrial Health Research Board of the Medical Research Council, and he is also an hon. consulting physician to the Ministry of Supply. In the University of Manchester he has been lecturer in factory hygiene since 1938 and lecturer in medicine since 1941. His publications include papers on lead-poisoning and on health-legislation in industry. He was elected FRCP in 1939.

University of Wales

Mr. Alastair Worden has been appointed to the research professorship in animal health recently endowed by Lord Milford at the University College of Wales, Aberystwyth, to investigate the health and productivity of livestock with special reference to human nutrition. Mr. Worden, who is a graduate of the Universities of Cambridge and London and a member of the Royal College of Veterinary Surgeons, is at present a member of the staff of the Institute of Animal Pathology, Cambridge.

Medical Society of LCC Service

There will be a meeting on Thursday, March 8, at 2.30 PM, at St. Stephen's Hospital, Fulham Road, SW10, when members of the staffs of St. Stephen's, Fulham, and St. Mary Abbott's Hospital will demonstrate cases.

Royal Society of Medicine

On Tuesday, March 6, there will be a meeting of fellows at 5 PM. On March 7, at 2.30 PM, at the section of history of medicine Mr. Henry Robinson, librarian of the Royal Society, will read a paper on Robert Hooke.

Food Education Society

The society is holding three lectures at the London School of Hygiene, Keppel Street, WC1, during April and May. On April 16, Mr. A. L. Bacharach will speak on the science, logic, and art of food; on April 23, Lord Portsmouth on food and agriculture, and on May 3, Sir Adolphe Abrahams, FRCP, on food and physique. All the lectures will begin at 2.30 PM.

MOH's Jubilee

The Mayor and council of Ilford, together with members of the staff of the public health department, have presented Dr. A. H. G. Burton with a gold fountain-pen and cheque. Dr. Burton has lately completed 25 years as MOH for the borough.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

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MEDICINE AND THE STATE*

LORD HORDER, M D LOND., F R C P
CONSULTING PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL, LONDON

I AM going to talk about the proposed National Health Service. This is a matter which deeply concerns all of us, whether we are on the threshold of our career, or, like myself, we are far advanced in it.

It is of great importance that we face the issue—for it is an issue—clearly and with judgment; and we can only do this if we recognise what is our proper function in relation to society. The hackneyed "to thine own self be true" applies as much to crafts and professions as it does to individuals.

I am not going to plunge into an involved discussion of the famous white-paper. As I shall say later, repeating what I have already said elsewhere, I believe the issue between ourselves and the Government can be reduced to fairly simple terms. There are essentials in this particular situation, as there are in most situations; and it is paramount that we see them and do not get stifled in a mass of details. I think the best way of finding these essentials is to consider quite briefly the basic factors in the—(how shall I put it?) the drama that is being enacted, or the battle that is being waged. I suppose the most apposite phrase would be the comedy that is being played, but if I choose that phrase I use the word "comedy" in the Meredithian sense.

The elements concerned are three: there is Medicine, there is Society, and there is the State. About Society—in which Medicine and the State meet—I shall not have much to say. But I want to take a step back and look at the two principal actors, assess their proper rôles, and thus be prepared to trace them through the play, watching to see if they follow their rightful cues or depart from these. Because in proportion as they follow their cues the play will be a good one.

It is only by taking this step back that we can get a proper perspective, and avoid being trivial. And if we are trivial our cause is lost.

Medicine

What then of Medicine? A definition is impossible and even a description is a bold thing to attempt. Medicine is a great corpus of knowledge and technique, a tradition, a steady stream of advance in science and art applied to human welfare, a brotherhood of common interest amongst those inside, and a great fund of good will towards those without. The material upon which Medicine lives and out of which it grows is all created things. It can say, with Bacon, "I have taken the universe for my parish." But its special study and care are the body and mind of man.

But when we have said all that, we have still omitted a very important and characteristic feature of Medicine. We have not included the large body of men and women all over the globe who are the disciples of Medicine and in whom, more than in books and museums and laboratories and even hospitals, *the spirit of Medicine is resident.*

What of these disciples? They are at first very ordinary men and women, but they gradually become consecrated in as true a sense as does the priest. No, on reflection, I don't think they are quite ordinary. I think it is likely that the medical student's exuberance—often shown in ways that the public, and even the stipendiary, doesn't understand—is only the expression of that spirit of adventure and conquest which, later on, becomes of tremendous value in Medicine. The layman often thinks we doctors are attracted to Medicine by sentimental and altruistic motives. Of course he is wrong. Medicine is to the good doctor a form of sport at first, and it remains so until the end. The student passes from ragging to the football or the cricket field, and thence to mountaineering and yachting, or, for the more contemplative, to fishing or gardening; but all the time Medicine is still his main pursuit. All the same there is this insidious evolution, to which I referred as consecration, going on in most of us. I cannot describe it better than—no, not half so well as—it was described by a great clinician, Peter Mere Latham: "This body," he said, speaking to his students, "must be your study and your continual care. Nothing must make you shrink from it."

> "In its weakness and infirmities you must still value it—and stay by it—to mark its hunger and thirst, its sleeping and waking, its heat and its cold. . . . And is it possible to feel an interest in all this? Ay, indeed it is; a greater interest than painter or sculptor took in the form of its health.
>
> "Whence comes this interest? At first perhaps it seldom comes naturally; a mere sense of duty must engender it; and still, for awhile, a mere sense of duty must keep it alive. Presently, the quick, curious, restless spirit of science enlivens it; and then the deliberate choice of the mind. When the interest . . . has reached this point, there arises from it . . . a ready discernment of diseases, and a skill in the use of remedies. And the skill may exalt the interest, and the interest may improve the skill, until, in process of time, experience forms the consummate practitioner. But does the interest of attending the sick necessarily stop here? . . . What if humanity shall warm it? Then this interest, this excitement, this intellectual pleasure, is exalted into a principle, and invested with a moral motive, and passes into the heart."

And if you think that is only idealism, then turn to the old realist Montaigne. There is, he said, "a ravishing kind of satisfaction in helping another."

THE DOCTOR

It is not possible to possess this power and to exercise it, as the doctor does, without its leaving its mark upon the character—yes, and upon the face.

Doctors are often sketched or drawn, and artists rather fancy themselves that they can paint the type. In some cases their observations haven't been very good, nor their work very complimentary. All the same, of course you *can* "spot" doctors again and again—in the train, on the bus and at the theatre. I have often been asked how I knew the doctor—quite a stranger to me—when I walked up to him at the arrival platform and bade him good morning. It would take some time to give the whole answer, and I mightn't always be understood; so I generally say that I accosted the most intelligent person I could see. I say "person" because I am getting fairly good at this with the other sex also—though the "whole answer" (not the one I give; for that, of course, is the same) is a little different.

I forget who it was who sat for the doctor in Luke Fildes's famous picture; but of course it isn't the beard, still less the professional attire, that bespeaks the man's job: it is that intense, that concentrated look, in which are depicted the interplay of various emotions—interest in the clinical problem presented, trust that what has been found good in his training and his experience will serve him now, humility in the face of things still unknown and withal a large dose of the tincture of human sympathy.

THREE AXIOMS

Are you thinking "but what has all this to do with Medicine?" My answer is, a great deal; much more than it has entered into the head of the politician to conceive.

I want to lay it down as an axiom that *Medicine is resident in a personnel* and if you take away the personal element from Medicine you emasculate it; that the doctor, with his special bent, his keenness, his long training, and his special experience, is an integral part of Medicine—is the most important part of Medicine. If you control him—by more than the control we all accept as members of a community—or and if you stereotype him and deprive him of his individuality, you do a great disservice to Medicine and therefore to Society.

I want to state two more axioms. My second is that a man does better work for himself and his security (and of course this includes his family) than he does for the State. Prof. Henry Cohen, in his excellent survey of the economic aspects of the situation, says, "if the service motive is not the *primum mobile* of human effort . . . why not accept it?"—i.e., why pretend that it is? And he quotes Mr. Davies as saying in his *Mission to Moscow* that the profit motive and self-interest are the mainspring of service in the USSR, where, from top to bottom,

* An address given before the Middlesex Hospital Medical Society on Jan. 18, 1945.

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production is stimulated by pensions and extra wages for service above what they conventionally call the "norm." And what is the "norm" in a doctor's work, anyway?

My third axiom is that Science, in order to progress, demands absolute freedom from political control; and since the best part of Medicine, as someone has pointed out, is a by-product of Science, the same freedom must exist for Medicine also. I could, of course, dilate upon this plea for freedom. I will content myself with a quotation from a pungent address given by Herbert Spencer to our American friends some sixty years ago. Remarked Spencer, "One of your early statesmen said 'the price of liberty is eternal vigilance.' But it is far less against foreign aggressions upon . . . liberty that this vigilance is required, than against the insidious growth of domestic interference with liberty." Here is obviously a man who should "be living at this hour."

Society

Neither Medicine nor the State can *make* a man healthy, whether in the "positive" or in any other sense, unless he wills it. And what I said of work and security applies to health and security. Some folk, as we know, are so fit that they are almost a danger to themselves; but the majority must do something to maintain fitness, and many do badly need our guidance and help. But even this laudable function has to be watched nowadays, so much is unloaded on the doctor.

The Medical Women's Federation issued a memorandum two months ago in which I read:

> The Federation holds the view that doctors, while having an obligation to society for the treatment of individual patients, have also a duty to interest and educate public opinion in medico-social questions so that these may be approached with understanding and sympathy.

To which I fully subscribe. But when I read further that these matters concerning which the doctor is to help include

1. A lowering of the standards of honesty and of consideration for others,
2. An increase in delinquency, including juvenile delinquency,
3. A more widespread and growing habit of indulgence in alcohol among young people,
4. The loosening of family ties,
5. Sexual incontinence,
6. The toleration of a low standard of certain types of reading matter and of public entertainment,

I begin to ask myself if we really do Society a good turn by carrying not only the baby but the whole family on our shoulders.

However, we have quite an extensive and a legitimate sphere in helping to keep the fit, fit; in making the near to fit quite fit; and in restoring, if we can, those who fall by the wayside. And we are quite ready to "get on with it" if this is recognised as our legitimate sphere.

The State

The third element which is concerned in achieving Health for the nation is the State. That is, the Commonwealth, or, as we express it (in terms of its custodian and mouthpiece) the Government. In democratic countries, one of which we claim to be, the State is like the Sabbath; the State is made for man, not man for the State. It is the servant of the community. In totalitarian nations on the other hand the citizens exist for the State.

The first function of the State is to keep the ring for the individual, not curtailing his freedom but encouraging it, always provided the exercise of his freedom is not inimical to the welfare of the majority of his fellows. The individual has freedom by right, not by permission of officialdom. His freedom is essential in order that he may do his work, which he does primarily for his own subsistence and satisfaction in life, and then to ensure the same for his family. In so doing he makes his contribution to Society. These are considerations which, as I have already said, apply to doctors as they do to other people.

The wise citizen does not look to the State to provide him with what he needs for his existence and his happiness: these are the result of his own work and foresight: and the wise State—that is, the wise statesman—does not try to give him a false sense of security by letting him think otherwise. What a great chance our statesmen missed when they faced the country with plans for security before plans for work! Man by the sweat of his brow and the tiger by the sweat of his paws (you remember?) finds his food first and gets his security afterwards.

THE PART OF PROTECTOR

Now it is a commonplace that the health of its citizens is a nation's best asset, and in this matter of health the State has a very important and legitimate part to play. This part is first and foremost a protective one.

Certain basic requisites being essential for health, a good Government keeps the ring (I cannot improve the simile) whilst the citizen provides himself with enough of the right food, warmth, and shelter, fresh air and sunlight, some leisure, and reasonable amenities. It keeps the trade routes open for bargains and exchange. It ensures an adequate supply of pure water; it sees to it that the cities are kept clean, and it prevents the spread of communicable diseases. It reduces the liability to accidents in the factories and on the roads. The State also sponsors the mothers upon whom it depends for its supply of citizens and ensures the infant a good chance of survival. It shields the old and the mentally afflicted.

But protection means more than encouragement of the honest citizen in his work; it means also discouragement, even to the point of penalty, of the dishonest citizen, and of the man who profiteers at the cost of his fellow citizens, health and happiness. For example, protection of the citizen means that his food must not be tinkered with to the detriment of its nutrient qualities, and that he must not be intimidated from the hoardings or from his newspaper by suggestions that if he does not swallow this or that nostrum he cannot possibly be fit. Lastly, the State shows its protective function by making Education possible for every child, man, and woman.

As I say, the impact of all this upon the nation's health is very definite; and if we substitute the word Medicine for Health we realise the truth of Virchow's dictum that "Politics is nothing else than Medicine on a large scale." It is right, therefore, that Medicine should infiltrate Politics, but it is disastrous for Politics to attempt to infiltrate Medicine.

THE STATE AND MEDICAL PRACTICE

In regard to those aspects of health of which we hear so much now—Positive Health, Social Health, and Industrial Health—the State should, and does, stake out a considerable claim. And now it proposes to interest itself in Medicine as applied to the individual citizen.

Well, we have been pressing for this for a good many years. We have urged that in this relation the great help which the State can give is in improving the machinery rather than in telling us how we should do our doctoring.

I want to stress the fact that Medicine not only does not question the general aims which are set out in the preamble to the white-paper—it welcomes them. It is necessary to emphasise this because Government spokesmen are presenting their case not only as though the principles concerned were new but also as though we who represent Medicine are laggard in accepting them and require coaxing, or even compulsion, in an attempt to implement them. Only a few months ago, when chairing an inaugural lecture by Professor Mackintosh at the London School of Hygiene, the Minister of Reconstruction said:

> "I understand from the newspapers that certain practitioners in the [medical] profession have some doubts about the condition of their service under the new plan. I beg them not to be unduly fearful. Terms are a matter of negotiation, but the end at which we are aiming cannot be a matter of controversy. The aim is that to every man, woman, and child in this country all that is best in medical science shall be available. . . . The medical profession has a long and glorious career of benevolence in the public service, but in spite of all their best endeavours, there remains in our midst much suffering and physical incapacity which I am given to understand is preventable. Common humanity demands that we should address ourselves to

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this problem and seek and find a solution to it. On grounds of sentiment—which are not to be despised—and on grounds of the economic health of the nation we must deal with this issue of physical ill health. We cannot afford the loss of capacity or the loss of time that comes from physical disability, and, with great respect, I invite practitioners of this great profession to refrain in discussion from anything which brings about that friction that leads to heat rather than to light. I invite them to join with those of us who are in public office and who are seeking that the way shall be open to an even larger field for their healing skill.... The public good must be served, and the doers of good must have both opportunity and just reward."

I find it difficult not to feel slight irritation when I read a homily like that. On the main issue Lord Woolton is preaching to the converted. The sentiment is crystal clear, but the methods hinted at are nebulous to a degree. Even the professor who delivered the lecture at which the Minister presided contributed only compliments and platitudes. He described the white-papers on the National Health Service and on Government employment policy as "valuable prescriptions from the pharmacy of social medicine," and exhorted us doctors to be "fearless in our devising, ready to cast out intolerance and partisan advocacy, unafraid of new plans for coöperative action, even when they run counter to traditions."

It is obvious that we shall need a good deal of patience with laymen who, having little knowledge of doctoring or of Medicine, have yet a genuine desire to see both of these harnessed to the chariot of the national health. As a specimen of this groping after methods by which to attain an end which everyone regards as highly desirable let me quote from Julian Huxley's *Democracy Marches* (July, 1941). Dr. Huxley has been speaking about the defects of our health services and of certain war-time measures which have gone some way to improve them. He goes on to say:

> The trend would seem fairly clear. It is towards the improvement of environmental agencies of health, such as housing and open spaces, and of that basis of all positive fitness, a really adequate diet; towards the incorporation of more and more doctors, whole or part-time, in a public medical service; an increased emphasis on prevention; the abolishing of the purely private nursing-home; then, the extension of the insurance principle to higher income groups, and the giving of more facilities for paying patients at hospitals; next, on coördinating more of the different elements in a single unified (but not necessarily uniform) system—both kinds of hospitals, general practitioners, and specialists; some arrangement by which specialists pool their knowledge and make it more generally available at lower fees; and finally, the growth of more centres for the encouragement of positive health.

Here is, indeed, a blunderbuss prescription. Let us look at its ingredients.

"Housing, open spaces and an adequate diet": here is obvious and excellent work for the State. "Incorporating more and more doctors in a public medical service": this is what I have called marching the doctors up the hill and marching them down again and "kidding yourself" (as children say) that you have improved things. "Prevention is better than cure"; agreed. "Abolishing the private nursing-home" may be linked with "giving more facilities for paying patients at hospitals": agreed again. "Extension of the insurance principle to higher income groups"—a matter for the political economists, and one with which, I think, most of us are in sympathy. Anyway, Government has decided upon a universal insurance scheme.

The next "trend" ("coördinating more of the different elements in a single unified . . . system—both kinds of hospitals, general practitioners, and specialists") is difficult of interpretation. It seems to mean more than merely "getting together"; probably it refers to rationalising hospitals and providing specialist services, and if so may be accepted as a good general principle.

We pass to the "pooling of specialists' knowledge and making it more generally available at lower fees." In so far as specialist knowledge *can* be pooled, it is; to suggest otherwise would be an unjust censure upon a group of men and women to whom the growth of Medicine owes a great deal But there is much in the specialist's contribution that cannot be pooled as documented knowledge. You can't document his craftsmanship, his technique, the way he approaches and deals with a clinical problem, synthesises his observations and arrives at a diagnosis. You can watch these things going on and you can make his services much more available than they now are; but if he could pool these things of which I have spoken he would cease to be a specialist. As for his fees, by organising a specialist service based upon regionalised hospitals, specialist fees could be lowered automatically. "The growth of more centres for the encouragement of positive health." To this we can surely again say "agreed."

WHAT SHOULD THE STATE DO FOR MEDICINE?

Many of us have for a long time stressed two steps which the State might take, both of which are long overdue—the regionalisation (and rationalisation) of the hospital services, and the inclusion of the dependants of the workers in the National Health Insurance scheme. Regionalisation of the hospitals and the setting up of health centres would provide the best possible basis for the organisation of a national consultative service, embracing physicians, surgeons, pathologists, and "special department" men.

Another and very important part of our health services in need of State help is the nursing service. Beyond taking it for granted that any scheme depends for its success upon an efficient nursing service, the white-paper is almost mute on this vital subject. We have too long paid only lip service to the nursing profession. Until the State recognises its duty in relation to the nurse's training and makes it possible, by adequate grants for the purpose, that the student nurse shall be recognised primarily as a useful citizen in training, rather than as merely an employee of the hospital—until this state of the student nurse is recognised and supported, recruitment into the profession from girls with the best brains and the keenest natures will continue to lag and efficient nurses will continue to be in short supply. This starvation will continue to show itself also in the ranks of the district nursing service, a branch of the profession upon which the country will probably rely more and more in the future.

In whatever ways the State decides to advance in the direction of improving our health services, it is clear that we shall need more doctors. The heavy expenses attaching to the education of doctors must be shared by the State, and in a number of ways—through much larger university grants, through subsidies to recognised medical schools, through scholarships and bursaries.

Then consider research. Our millionaires have been most forthcoming and we are grateful to them. But there must be a much clearer official recognition of the essential contribution which research makes to the efficiency and progress of Medicine. The degree of recognition which research gets at present is reflected in the fact that the white-paper disposes of it in thirteen lines, most of which are taken up by saying that the present state of medical research is satisfactory and requires nothing further done about it.

THE MACHINE AND THE MAN

I have tried to indicate the main ways in which the State can function in Society's interest in the field of Health. It will have been seen that all these ways really concentrate upon the *machinery* of Medicine and making it possible for the personnel to be efficient. The rest is up to us, up to Medicine. Our case with the State is surely just this—we say in effect "if, with our help, you will improve the machine whereby *availability* of medical service to every citizen is made possible, we will work the machine in the manner that we know from experience to yield the best results." But be it noted that we do *not* think (or I should say most of us do not think) that if doctors are made *a part of the machine* the same degree of efficiency will follow. In other words many—both citizens and doctors—believe that a State medical service is not only an unnecessary innovation but one which is unlikely to give the best results in Medicine in this country. Where the public is uncertain it is our bounden duty to convince it of this.

When the system of State control prevalent in Russia is held up to us as a model which we might usefully

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follow it is necessary to remember that the slow evolution of our own health services—many of them quite admirable if only availability were ensured—has been quite different from anything that has happened in Russia; nor must we forget that "bloody revolution" in that country necessitated a re-start from scratch. If any should deny that the white-paper envisages the beginning of a whole-time State medical service—and its political sponsors do deny it—I would remind you that the Left Wing politicians have not only welcomed the white-paper as a useful compromise, but that Mr. Arthur Greenwood said in the House of Commons that he welcomed it as a great contribution towards the kind of plan which, in the fullness of time, his party would like to see established. I believe that the public, when it is really stirred to consider this matter—for up till now it has been complacent, and only mildly intrigued by what it thinks is a squabble between the doctors and the politicians—I believe the people will vote heavily against making all doctors Civil Servants.

Of the many handicaps and restrictions such a system would impose upon Medicine and therefore upon the public, I shall only touch upon two or three.

"Free choice of doctor," for example, has become a familiar slogan, but this would be almost impracticable if all practitioners were State-controlled. In a State service the "black market" in doctoring would be terrific! Then again, that spirit of initiative and adventure to which I referred in dealing with the doctor's personality, and which have always characterised British Medicine, demand a more individual outlook for the doctor than a State service can offer, if men and women with good brains and healthy ambition are still to be attracted to the profession.

The position of the voluntary hospitals under the proposed scheme has been the subject of much discussion and in this connexion the public is showing more awareness concerning the possible dangers ahead. This is no doubt largely due to the prompt action of interested laymen who are responsible for the administration of these great institutions. The future existence of the voluntary hospitals is rendered precarious both because of the form of control suggested in the white-paper and also because of inadequate financial guarantees. But what I specially want to point out here is that the voluntary hospital is the best medium in which that initiative and adventure just spoken of can and do exercise themselves and is the centre from which the most striking advances, both in clinical knowledge and in laboratory research, have radiated. It is also the practical training ground of doctors. If it suffers all these things will suffer with it.

Two Essentials

I said earlier in this address that I believed the essentials in the issue now being settled were few and that we should concentrate upon them. They are really two.

There is the question of control *on the medical side* of all extensions of the health services contemplated by the Government, whether of personnel or of institutions. This control must provide adequate medical representation at the centre and at the periphery upon both the advisory and the executive bodies. It should not be past the wit of the Minister of Health and his colleagues to make this adjustment from the white-paper without sacrificing the constitutional principle that the Minister must be responsible to Parliament for the efficient working of the scheme. There are good examples of this both in the Ministry of Education and the Ministry of Pensions.

The second essential is that the liberty of the doctor, whether general practitioner or consultant, should be preserved. It should not only be *permitted* that a man shall carry on his practice privately if he so desires, he shall be *encouraged* to do so, by seeing that he is not penalised through restricted facilities.

If Medicine is monopolised, or stereotyped, by Government control, a very serious disservice will be done both to Medicine itself and to the community. It is our duty, as I have said, to safeguard these two positions. If, and only if, we can do so, let us help wholeheartedly and pull our entire weight in the service of our fellows.

DEHYDRATION

D. A. K. BLACK, MD ST. AND., MRCP
MAJOR RAMC

Central Military Pathological Laboratory, India Command

WATER accounts for 60% or more of the weight of the adult human body, and a pathological decrease in this amount of water causes profound disturbances of metabolism, of the circulation, and of renal function. In the past ten years, laboratory investigations have made it clear that a distinction exists between dehydration caused by primary loss of water, and dehydration in which the loss of water is secondary to a reduction in the total salt content of the body. The purpose of this paper is to summarise these advances in physiological knowledge, and to discuss their application to the clinical syndrome of dehydration, in which water and salt loss are often combined.

NORMAL INTAKE, OUTPUT, AND DISTRIBUTION OF WATER

The credit side of the water balance is derived from beverages, from water contained even in "dry" foods, and from the water of oxidation of carbohydrates, proteins, and fats. In a temperate climate, 2·5 litres represents an average daily water intake, including 300–400 c.cm. of water from the oxidation of an ordinary mixed diet. Water is lost from the body in the expired air, through the skin by insensible perspiration, in the sweat, and in the fæces and urine. The amounts lost by these various channels depend greatly on the environment, as well as on diurnal changes in fluid intake.

From 200 to 500 c.cm. per day is lost in the expired air, the amount depending on the humidity of the inspired air, and on the pulmonary ventilation, which is increased by exertion, or by breathing a rarefied atmosphere. The daily loss of water through the skin, apart from sweating, is about 500 c.cm.; this is affected mainly by the temperature, humidity, and rate of circulation of the surrounding air. The amount of sweat is determined by exertion and external temperature within very wide limits, from inappreciable amounts up to a litre or more in an hour. Water lost in the fæces, in the absence of diarrhœa, is from 50 to 150 c.cm. per day. The water eliminated in the urine is regulated in volume to compensate for changes in fluid intake, and in the amount of water lost by extrarenal channels. This regulation seems to be mediated very largely by the amount of pituitary anti-diuretic hormone present in the blood-supply to the kidney. The amount of water in the body is kept reasonably constant by variations in the intake in response to thirst, and by variations in the urine volume to counterbalance such changes in the water-loss by skin and lungs as are required to maintain a normal body temperature. The water turnover is greater in the tropics and during physical exertion.

It is convenient to think of the body-water as being distributed in three compartments—the blood-vessels, containing plasma; the tissue spaces, containing interstitial fluid; and the cells, including the red blood-cells, containing intracellular fluid (Gamble 1937). Plasma and interstitial fluid can for some purposes be grouped together, as extracellular fluid. The approximate amounts of fluid in the different compartments in a man weighing 70 kg. are as follows:

	% *of body-wt.*	*Litres*
Total body fluid	65	46
Plasma	5	3
Interstitial fluid	20	14
Intracellular fluid	40	29

The capillary endothelium and the cell wall, which divide these compartments one from the other, are freely permeable to water itself, which passes from one compartment to another, the direction and magnitude of the transfers being determined by the amount of protein and salts in the various compartments. A dynamic osmotic equilibrium is therefore maintained, in which the total concentration of osmotically active substances, colloids, non-colloids, and ions, is the same in all the compartments, although individual substances

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may differ in concentration in adjacent compartments. Differences in the concentration of individual dissolved substances depend on the selective permeability of the membranes separating the compartments. The healthy capillary endothelium is relatively impermeable to protein, and plasma differs from interstitial fluid mainly in its high protein content; the minor differences in electrolyte concentration between plasma and interstitial fluid are secondary to the great difference in protein content (Loeb et al. 1922). The cell wall is not freely permeable either to protein, or to sodium, potassium, chloride, or phosphate ions; this makes possible a different electrolyte pattern in extracellular and in intracellular fluid. Extracellular fluid has sodium as the predominant basic ion, with only small amounts of potassium, calcium, and magnesium; chloride is the main anion. Intracellular fluid has potassium as the main cation, and phosphate is the predominant acid radicle, while it is doubtful whether sodium and chloride occur inside tissue cells. Urea is distributed equally through the body-water.

WATER DEFICIENCY

The effects of water deficiency must be studied apart from those of starvation and of salt deficiency. Experiments in which human beings have been given an adequate diet and salt intake, but deprived of as much as possible of their water intake, have been carried out by Wiley and Wiley (1933), Nadal and others (1941), and Black, McCance, and Young (1944). The body-weight begins to fall as soon as the subject stops taking water, and the loss of weight is in fact greater on the first than subsequent days. In 3–4 days of dehydration the weight-loss amounts to about 6% of the body-weight, corresponding to 10% of the body-water. In spite of this considerable weight loss, general symptoms are not severe, although thirst, huskiness, and inability to swallow cause much discomfort. A peculiar pinched and grey appearance of the face makes the subject look worse than he feels. The comparative well-being in pure water-deficiency may be related to the fact that the circulation is well maintained; blood-pressure is normal, the superficial veins are well filled, and the hæmoglobin and hæmatocrit values show no definite increase even on the third or fourth day of water deprivation. Moreover, the diodone clearance, which is a measure of the blood-flow through the kidneys, is not decreased (Black et al. 1942).

There is a moderate rise in blood-urea. When this is compared with the amounts of urea excreted daily before, during, and after the dehydration period, it is found that the amount of urea produced in the body rises during water deprivation, suggesting that body-protein is being broken down more rapidly. Sodium and chloride in the plasma increase by about 10%.

In conformity with this observation, it has been found (Black et al. 1944) that while the water content of the body falls by about 10% the electrolyte and urea content shows a slight increase, so that, distributed evenly over the smaller volume of body-water, it would produce an increase in concentration of the same order as that directly observed. Since the osmotic pressure of the plasma depends on the concentration of its osmotically active constituents, and the plasma is in osmotic equilibrium with the other body-fluids, there must be a progressive rise in the osmotic pressure of the body-fluids during the period of water deprivation. In contrast to the sodium and chloride in plasma, the potassium shows a slight fall, and the urinary excretion of potassium rises during water deprivation (Elkinton and Winkler 1944). As has been mentioned, extracellular fluid has sodium as the main base, and intracellular fluid potassium; it is therefore possible to deduce the proportion of extracellular and intracellular fluid lost from the body, by comparing the sodium and potassium balance after allowance has been made for changes in the blood concentrations. In this way it has been found that about two-thirds of the total water lost is derived from inside the cells; since the body contains about twice as much intracellular as extracellular fluid, the water inside the cells contributes the same proportion of its volume as the water outside, and the loss of fluid is distributed over the whole volume of body-water.

McCance and Young (1944) have studied the secretion of urine during water deprivation. The urine volume falls within 12 hours to about 500 c.cm. per day. The daily volume of urine passed during dehydration is higher when the diet contains normal amounts of salt than when it is poor in salt. Injection of hypertonic solutions of salt or of urea causes a diuresis even during dehydration. The daily urine volume increases slightly as the concentration of urea and electrolytes in the plasma rises. The urea clearance falls as soon as the urine volume becomes low (Chesley 1938), but does not undergo any further fall. The inulin clearance is either normal or slightly diminished. The urine excreted is concentrated, with specific gravity above 1030, weighed solids over 5 g. per 100 c.cm., and osmotic concentration 1000 m. osmols per litre or more. Up to the third or fourth day of water deprivation, there is therefore no evidence of renal failure, and the abnormalities in urinary secretion are those imposed on the kidney by the small volume of water available for urine formation.

SALT DEFICIENCY

Experimental salt deficiency is brought about by forced sweating, with replacement of fluid by distilled water, the diet containing minimal amounts of salt. A full account of the observed changes is given by McCance (1936) in his Goulstonian lectures, and it is enough for our present purpose to outline the fundamental differences between deficiency of water and of salt.

The effects on well-being of salt deficiency are greater than those of a comparable degree of water deficiency. Mental apathy and general exhaustion are more in evidence. The painful cramps of salt deficiency are not found in water deficiency. Circulatory failure is a prominent feature of salt loss, and hæmoconcentration is observed early. Although nitrogen retention is common to both conditions, the plasma electrolytes in salt deficiency are diminished, in striking contrast to the increase in plasma sodium and chloride observed in water deficiency. Excretion of potassium does not increase in pure salt deficiency. The urine volumes in salt deficiency are not so low as those in water deficiency, and the urine is more dilute; the urea clearance is more depressed, especially in relation to the greater volume of urine passed.

In the presence of an absolute deficiency of sodium chloride in the body, it is not possible to maintain the volume of extracellular fluid, and in spite of a free intake of distilled water the amount of water in the body diminishes. The basic difference between primary salt and primary water deficit appears to be that in salt deficiency the whole burden of the fluid loss falls on the extracellular fluid, while in water deficiency both extracellular and intracellular fluid are drawn upon. For any given amount of fluid loss, the effect on plasma volume, and so on circulatory efficiency, will be about three times as great when the fluid loss is due to salt deficiency as when it is due to water deficiency. This accounts for the hæmoconcentration of salt deficiency, and possibly for the renal failure.

CLINICAL DEHYDRATION

Workers in stoke-holds and mines may show primary salt deficiency, while on rafts and in the desert men suffer from a primary water deficiency, usually complicated by relative starvation. But in ordinary clinical practice, where dehydration is caused partly by loss of body fluids which differ in their salt content, and partly by interference with intake of food, chloride, and water, it is not surprising that clear-cut deficiencies are uncommon, and most patients show a fluid imbalance which lies somewhere between water and salt deficiency as studied in isolation in the laboratory. Nevertheless it is of the first importance in each individual case to find out which deficiency is predominant; for the physiological changes are very different, and treatment such as hypertonic saline, directed to relieving salt deficiency, would undoubtedly make a patient worse if he was deficient mainly in water.

It is fortunate that a patient's kidneys may possess more discrimination than those who are giving him intravenous fluid therapy, and if a sufficiently large amount of fluid is given healthy kidneys can avert many of the dangers of an ill-considered choice of fluid (Peters

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and Van Slyke 1931). Even so, it is wasteful to give the wrong kind of fluid, for this makes the kidneys perform additional work and use additional fluid in excreting, for example, an unnecessary amount of sodium chloride. It also means that more fluid must be given, and in the case of intravenous therapy the giving of unnecessarily large volumes of fluid carries its own risks. Finally, the kidneys themselves may be functioning imperfectly, and even in health the power to excrete salt has definite limits, especially in infants.

The relevant data in deciding whether a patient is suffering mainly from water deficiency or from salt deficiency are derived from knowledge of the cause of fluid imbalance, from clinical observation, and from such laboratory findings as are readily available.

(*a*) *The cause of fluid imbalance.*—Most clinical dehydration is caused by increased loss of one or more body fluids or excretions, in the presence of a normal or diminished fluid intake. It is obvious that the loss of hypotonic fluids, such as sweat and the moisture of expired air, will tend to cause a water deficiency, while the loss of isotonic fluids (gastric and intestinal secretions, bile, blood plasma) is more likely to cause a salt deficiency, especially since a normal diet contains 2·5 litres of water but only 10 g. of salt, and a "fluid diet" may contain the same or a larger amount of water and a smaller amount of salt. Inability to swallow food and water tends to produce a deficiency of water rather than of salt, but vomiting has the opposite effect. In addition to the external losses of fluid, which can be measured, the possibility of internal shifts of fluid must also be kept in mind. For example, in pneumonia the obvious losses of fluid are in the sweat and in the expired air, both hypotonic; but actually salt deficiency is observed, owing to the loss of chloride into the bronchial exudate.

(*b*) *Clinical observations.*—Many of the clinical features of dehydration are common to both water and salt deficiency—loss of weight, thirst, dryness and wrinkling of the skin, dry tongue, and lowered intraocular tension. Muscular cramps however are characteristic of salt deficiency. Circulatory failure is greater in salt deficiency, with collapsed veins, low blood-pressure, and "dehydration fever" due to diminished skin circulation. The fluid balance chart should be supplemented by at least a mental salt balance; the salt content of fluids taken by mouth or given parenterally should be recorded, and when possible the salt content of the urine.

(*c*) *Laboratory findings.*—The main value of laboratory investigations is in establishing definitely whether the body fluids contain more or less salt than normal, or about the same amount. Laboratory examination is also useful in determining the presence or absence of hæmoconcentration, and in detecting acidosis or alkalosis.

Depending on the facilities available, the amount of salt in the body fluids can be judged approximately by the amount of chloride excreted in the urine, more accurately by estimation of the plasma chloride, and with greatest accuracy by estimation of the serum sodium or total base. The chloride content of the urine can be estimated in the clinical side-room by a drop method with potassium chromate and silver nitrate. In most cases, a low urinary chloride suggests salt deficiency, while a high urinary chloride in conjunction with a low urine volume is a sign that water deficiency predominates. Complete reliance cannot be placed on the urinary findings, however, for anomalous cases occur in which the urine chloride is low, while the plasma chloride is increased (Allott 1939). Estimation of the plasma chloride, while more valuable than the urine chloride, is still not a certain measure of the osmotic state of the body fluids, for changes in the alkali reserve may be attended by changes in the plasma chloride without any alteration in the serum sodium or total base. Sodium forms more than 90% of the total base of extracellular fluid, and can be estimated more rapidly than total base, so the estimation of serum sodium is the method of choice for assessing the salt content of the body fluids.

Hæmoconcentration is detected by observing day-to-day changes in the hæmatocrit, hæmoglobin, or red-cell count, or in the plasma proteins. Intercurrent losses of red cells or of plasma, and antecedent anæmia or hypoproteinæmia must of course be considered in assessing the results of these estimations; similarly, allowance must be made for infusions of blood or plasma. The alkali reserve should be estimated in all cases of dehydration associated with vomiting or diarrhœa, alkali administration, or starvation.

CHOICE OF FLUID AND CONTROL OF TREATMENT

The route of election for all fluid therapy is the alimentary tract, by mouth if possible, if not by duodenal or rectal tube; for fluid given by mouth is better retained than fluid given intravenously, and there is no risk of over-loading the circulation. Parenteral administration of fluid is an emergency measure, to be discontinued as soon as it becomes possible for the patient to take enough fluid in the normal way.

Anæmia and low plasma protein call for treatment by infusion of blood or plasma. The indications and control of such treatment are being defined more closely as work on hæmorrhage and shock proceeds, and they cannot be considered here.

The fluids generally available for the treatment of dehydration per se are water, 5% glucose, 0·45% saline ("half-normal saline"), 0·9% saline ("normal saline"), and hypertonic saline, usually 2%. In general terms, water and 5% glucose are appropriate in treating water deficiency, water being given by mouth or rectum and 5% glucose parenterally. Half-normal saline and normal saline are indicated in mixed water and salt deficiency, the usual type to occur clinically. Half-normal saline has the advantage that it can be given by mouth without producing nausea; it is specially valuable in infants whose powers of salt excretion are limited. Hypertonic saline is of very limited usefulness, in comparison with the other fluids, for it cannot be given by mouth, and it is safely given by vein only in the severest forms of salt deficiency, such as cholera, where several litres of saline fluid are lost in a few hours. The commoner forms of salt deficiency are better treated with normal saline, which contains 9 g. of salt per litre, while most body fluids contain only 6 g. per litre. Treatment should be controlled by the same observations and estimations as are used in making the initial discrimination between water, salt, and mixed water-and-salt deficiency. Any patient receiving intravenous fluids should have a quantitative assessment of his fluid requirements made daily, and fluid for the next 24 hours prescribed with as much care as should be used in sulphonamide or penicillin therapy.

SUMMARY

In water deficiency the urine is concentrated and of low volume, the osmotic pressure of the plasma is high, and in the earlier stages at least there is no hæmoconcentration. In salt deficiency the urine is dilute and there may be polyuria, the osmotic pressure of plasma is low, and there is hæmoconcentration.

In clinical dehydration water and salt are usually both deficient, but in varying degree, and it is still important to assess which deficiency predominates, for treatment appropriate to salt deficiency is quite unsuitable when water is depleted to a greater extent than salt.

In judging the nature of the deficiency present in any given patient, the cause of fluid imbalance must be considered as well as his present clinical state. Additional help is given by estimation of the chloride in urine or plasma, or of the serum sodium.

The appropriate fluids for treating water deficiency are water or 5% glucose, for treating mixed water and salt deficiency normal or half-normal saline, and for treating salt deficiency normal saline, except in the severest cases where hypertonic saline may be required.

I am indebted to the Director of Medical Services in India for permission to publish this paper.

REFERENCES

Allott, E. N. (1939) *Lancet*, i, 1035.
Black, D. A. K., McCance, R. A., Young, W. F. (1942) *Nature, Lond.* **150**, 461; (1944) *J. Physiol* **102**, 406.
Chesley, L. C. (1938) *J. clin. Invest.* **17**, 591.
Elkinton, J. R., Winkler, A. W. (1944) *Ibid.* **23**, 93.
Gamble, J. L. (1937) *Bull. Johns Hopk. Hosp.* **61**, 151.
Loeb, R. F., Atchley, D. W., Palmer, W. W. (1922) *J. gen. Physiol.* **4**, 591.

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EXPERIMENTAL NEPHROSCLEROSIS
PREVENTION WITH AMMONIUM CHLORIDE

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IT is well established, on the basis of experiments with many animal species, that desoxycorticosterone acetate (desoxycortone) produces nephrosclerosis and hypertension, especially if it is given to unilaterally nephrectomised animals kept on a high sodium chloride intake (Selye and Hall 1944). Under certain conditions these renal changes are accompanied by periarteritis nodosa, as well as by cardiac and joint lesions, which resemble those characteristic of rheumatic fever (Selye and Pentz 1943, Selye et al. 1944). On the other hand, it has been shown that exposure to various nonspecific damaging agents (cold, infections, trauma, nervous stimuli, &c.) elicits an adaptation syndrome whose acute stage became known as the "alarm reaction," while its secondary phase is generally described as the "stage of resistance" (Selye 1940). Although the first observations on this adaptation syndrome were made on animals, it has recently been demonstrated that human beings react in the same manner (Glendening et al. 1944). Perhaps the most salient change during these adaptive defence reactions is the hypertrophy and hyperfunction of the adrenal cortex. Hence the question arose whether chronic overdosage with endogenously produced desoxycortone, or allied corticoid substances, could be the cause of renal hypertension in man.

Experimentally it was demonstrated that chronic exposure to nonspecific damaging agents (especially to cold) produces adrenal cortical enlargement and simultaneously nephrosclerosis with hypertension in the rat (Selye 1944). As it is well known that continuous exposure to stress and strain tends to produce renal hypertension in human beings, it is perhaps not too far fetched to suspect possible ætiological relationships between the above-mentioned types of experimental nephrosclerosis and the corresponding disease of man. In view of these relationships we decided to use the experimental disease as a test object on which we could assay the possible nephrosclerosis-inhibiting action of various hormones and drugs. In this experimental procedure we merely followed the line of thought which proved so successful to Canadian endocrinology some 20 years ago when Banting and Best used the pancreatectomised dog as a test object for the assay of insulin, reasoning that a preparation which would cure experimental diabetes should also prove effective in the corresponding disease of man.

This type of experimentation revealed a short time ago that testosterone tends to antagonise the nephrosclerotic action of desoxycortone (Selye and Rowley 1944); but, in view of the strong virilising effects of testosterone, its clinical applicability is somewhat limited. We therefore continued our search in the hope of finding a therapeutic agent which is active in preventing nephrosclerosis but has no unpleasant side effects. Extensive studies concerning the biochemical changes induced by desoxycortone overdosage in animals revealed striking disturbances in the electrolyte metabolism and particularly a well-marked rise in the serum-sodium to serum-chloride ratio. The theoretical aspects of this work, as well as a detailed description of the chemical findings, will be reported elsewhere. In this communication we merely wish to summarise the most salient data which may prove to be of practical interest to the clinician—namely, that ammonium chloride restores the serum Na/Cl ratio towards normal, and at the same time prevents experimental nephrosclerosis in the rat.

References continued from previous page

McCance, R. A. (1936) *Lancet*, i, 823; Young, W. F. (1941) *J. Physiol.* **99**, 265; (1944) *Ibid*, **102**, 415.
Nadal, J. W., Pedersen, S., Maddock, W. G. (1941) *J. clin. Invest.* **20**, 691.
Peters, J. P., Van Slyke, D. D. (1931) Quantitative Clinical Chemistry, Baltimore, vol. I.
Wiley, F. H., Wiley, L. L. (1933) *J. biol. Chem.* **101**, 83.

EXPERIMENTAL

Six groups of animals were used, each consisting of 10 unilaterally nephrectomised female albino rats weighing 40–60 g. The left kidney was removed in all these cases since earlier experiments (quoted in the introductory part of this paper) had demonstrated that partial nephrectomy sensitises the remaining kidney to the nephrosclerotic effect of desoxycortone. All animals were fed exclusively on "purina fox chow."

Groups 1, 2, and 3 were kept on tap water and groups 4, 5, and 6 on 1% NaCl solution. Both drinking fluids were given ad lib. It will be recalled that NaCl increases the nephrosclerotic activity of desoxycortone and it is for this reason that two parallel series of experiments were performed using ordinary drinking water in half and NaCl solution in the other half of our animals. One group of each series (groups 1 and 4) served as water-treated and salt-treated controls, while every animal in the remaining four groups was given subcutaneous implants of four desoxycortone pellets prepared under a pressure of 150 lb. and weighing 10 mg. each. Groups 2 and 5 received no other treatment than the desoxycortone pellets, and they were to show the action of this steroid on water and salt water intake respectively. Groups 3 and 6, on the other hand, were given 0·9% ammonium chloride in addition to the desoxycortone. For group 3 the ammonium chloride solution was made up in tap water, while for group 6 it was made up with 1% NaCl, which contains approximately the same number of Cl ions per c.cm. as 0·9% NH_4Cl—that is to say, in this last group the drinking fluid contained twice the number of Cl ions but the same number of Na ions per c.cm. as groups 4 and 5.

Nine of the ten rats in group 5 died from desoxycortone overdosage during the experiment, mostly with pronounced nephrosclerotic changes. All other animals survived until the 57th day after pellet implantation, at which time they were sacrificed, their blood being taken for chemical analysis, and their kidneys and hearts for histological study. The degree of sclerosis in the kidney and the number of periarteritic (rheumatic ?) nodules in the heart muscle were estimated in each animal and expressed in a scale ranging from "0" to "+++."

The percentual intensity of nephrosclerosis and cardiac lesions was computed by adding the total number of plusses in each group and then dividing by the number of animals in the group. The resulting figure was then expressed as a percentage of the theoretical maximum of "+++" in all animals of a group. This procedure gives a fair estimate of the average intensity of the lesions.

The average incidence was similarly computed disregarding the intensity of the change and taking every organ with a demonstrable lesion as positive.

The weight of the heart and kidney was expressed as a percentage of the body-weight.

The serum Na/Cl ratio was determined by dividing the milliequivalents of Na by the milliequivalents of Cl per 100 c.cm. of serum for each animal and calculating the average for each group. Table 1 summarises the mean values computed in this manner.

The standard errors are listed with the organ weights and Na/Cl ratios.

In confirmation of our previous observations, we see from table 1 that desoxycortone is more toxic on a high than on a comparatively low NaCl intake (compare groups 2 and 5). Treatment with NH_4Cl prevents the development of pathological changes in the kidney and heart both in the animals kept on tap water (compare groups 2 and 3) and in those receiving salt water (compare groups 5 and 6). This inhibition is seemingly more complete in the group receiving tap water, since here the toxicity of the desoxycortone appears to be completely counteracted. Yet among the NaCl-treated animals the beneficial effect of the NH_4Cl is perhaps even more dramatic, because in these desoxycortone, unopposed, induced a 90% death-rate which was prevented by the addition of NH_4Cl even though a trace of nephrosclerosis was detectable in 1 of the 10 animals of this group.

Comparing these cardiac and renal lesions with the serum Na/Cl ratio, we note that the highest ratio is in the group having very pronounced pathological organ changes. Unfortunately, all but one of the animals in

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TABLE I—RENAL AND CARDIAC LESIONS IN RELATION TO THE SERUM NA/CL RATIO (FLUID INTAKE AD LIB.)

Group	Treatment	Nephrosclerosis		Cardiac lesions		Heart wt.	Kidney wt.	Av. serum Na/Cl ratio
		% incidence	% intensity	% incidence	% intensity	as % of body-wt.		
1	H_2O	0	0	0	0	0·36 ± 0·01	0·55 ± 0·02	1·40 ± 0·03
2	H_2O + DCA	100	70	70	27	0·57 ± 0·04	0·70 ± 0·02	1·62 ± 0·03
3	H_2O + DCA + 0·9% NH_4Cl	0	0	0	0	0·43 ± 0·02	0·69 ± 0·01	1·51 ± 0·05
4	1% NaCl	0	0	0	0	0·36 ± 0·01	0·62 ± 0·01	1·53 ± 0·03
5	1% NaCl + DCA	(100)	(100)	(100)	(67)	(0·69)	(1·39)	* (see below)
6	1% NaCl + DCA + 0·9% NH_4Cl	10	3	0	0	0·48 ± 0·02	1·08 ± 0·01	1·52 ± 0·05

*. In this group all but one animal succumbed in the course of the experiment. The values in parentheses are based on histological examination of the organs in this single rat; its blood was not taken for analysis. DCA = desoxycortone.

TABLE II—RENAL AND CARDIAC LESIONS IN RELATION TO THE SERUM NA/CL RATIO (PAIRED FLUID INTAKE)

1	1% NaCl + DCA	80	50	90	57	0·54 ± 0·02	1·01 ± 0·04	1·73 ± 0·06
2	0·9% NH_4Cl + DCA	10	3	10	3	0·44 ± 0·02	1·04 ± 0·06	1·36 ± 0·04

group 5 succumbed in the course of the experiment, and hence there was not sufficient blood to obtain statistically significant data concerning the ratio in this group. However, even more convincing data concerning the correlation between the pathological changes and the index will be reported in connexion with additional experiments summarised in table II.

It is also evident from table I that NaCl in itself has little, if any, effect on cardiac and renal weight, but that desoxycortone on a high NaCl intake causes an even more pronounced hypertrophy of both these organs than on a low NaCl consumption. Curiously, treatment with NH_4Cl markedly counteracts the cardiac hypertrophy caused by desoxycortone without noticeably influencing the kidney-enlarging effect of this steroid. This action of NH_4Cl appears to be essentially the same in the animals receiving tap water and in those kept on the high NaCl intake.

Histological study of the kidneys (see figs. 1–6) shows that in the groups receiving NH_4Cl the tubular cells are enlarged and apparently hyperplastic, but there is no nephrosclerosis. In many cases light vacuoles appear underneath the free surface of the tubular epithelia. These vacuoles are often enclosed in large cytoplasmic buds which protrude deep into the tubular lumen. The significance of the vacuoles is not quite clear, as yet, and forms the subject of further studies, but the general appearance of the large tubular cells is suggestive of hyperfunction and somewhat reminiscent of the kidney-growth-stimulating or "renotrophic" action of testosterone and other virilising steroids. In any case, it is probable that the absence of nephrosclerotic changes in the NH_4Cl-treated groups is responsible for the comparatively small heart weight in these series. Histologically the cardiac muscle fibres in the two NH_4Cl-treated groups (groups 3 and 6) remain practically normal, while they undergo pronounced hypertrophy in the corresponding desoxycortone-treated groups which received no NH_4Cl (groups 2 and 5). It appears reasonable to assume, as a working hypothesis, that the NH_4Cl inhibited the cardiac hypertrophy merely because it prevented the nephrosclerosis which is normally responsible for the compensatory hypertrophy of the cardiac muscle.

The average fluid intake was measured daily in all groups, and it was found that while desoxycortone increased water intake and diuresis—especially in animals kept on the high NaCl intake—addition of NH_4Cl to the drinking water counteracted this effect. Hence it appeared possible that the beneficial action of NH_4Cl might merely be due to the decreased diuresis occasioned, not necessarily by any paradox antidiuretic effect, but simply by the unwillingness of the animals to take large amounts of solutions containing the ammonium salt.

SECOND EXPERIMENT

In order to prove the specific nephrosclerosis-inhibiting property of NH_4Cl, a second experiment was performed as follows. Two groups of 10 unilaterally nephrectomised, female albino rats weighing 40–60 g. were given subcutaneous implants of three desoxycortone pellets prepared under a pressure of 150 lb. and weighing 10 mg. each. Group 1 received 1% NaCl and group 2 0·9% NH_4Cl as drinking fluids. It will be recalled that these two solutions are equivalent with regard to their Cl ion concentration. Although the animals in the NaCl-treated group again exhibited an increased desire for the ingestion of large quantities of fluid, they were only allowed to drink as much as the rats of group 2 voluntarily took. Hence the total amount of chloride ions consumed was identical in the two groups. This experiment was terminated after 37 days, at which time none of the animals had died from desoxycortone overdosage as yet. After sacrificing the rats, their blood and organs were taken for studies similar to those performed on the previously reported series. Table II sumarises the data obtained.

Perusal of table II clearly indicates that the serum Na/Cl ratio was considerably higher in the group receiving NaCl than in that receiving the same number of Cl ions in the form of NH_4Cl. Correspondingly, the nephrosclerosis and the incidence of cardiac nodules was also much greater in group 1 than in group 2. This observation confirms our belief that the development of pathological lesions due to desoxycortone overdosage is not directly dependent on the urine output or the absolute amount of chloride ingested, but probably on the resulting Na/Cl ratio. It should be emphasised that in this, as in the previous, experiment the total weight of the kidney was not significantly influenced by the NH_4Cl, but the cardiac hypertrophy usually caused by desoxycortone was prevented by this salt in proportion to its nephrosclerosis-inhibiting effect.

It is difficult to express the degree of generalised periarteritis nodosa in a quantitative manner, but vascular lesions of this type were detectable, especially in the mesenteric vessels, in all desoxycortone-treated groups in both experimental series, while such were never observed in any of the animals treated with NH_4Cl in addition to the desoxycortone. It is noteworthy that the absorption of desoxycortone from the pellets was not influenced by NH_4Cl as judged by the weight of the pellets at autopsy. It may, therefore, be said that NH_4Cl proved highly effective as a true pharmacological antagonist of desoxycortone, capable of counteracting the nephrosclerosis as well as the development of cardiac nodules and periarteritis nodosa in all these experiments.

It will be recalled that some time ago Durlacher and colleagues (1942) and Darrow and Miller (1942) expressed the view that the toxic effects of desoxycortone on the heart and kidney may be due to the loss of potassium caused by this compound. This view appeared to receive support from experiments in which they demonstrated that a low potassium diet causes renal enlargement and cardiac changes similar to those elicited by desoxycortone, and that treatment with KCl inhibit these toxic effects presumably by restoring the blood potassium level. However, at the time these workers performed

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MICROSCOPICAL APPEARANCES OF THE KIDNEY

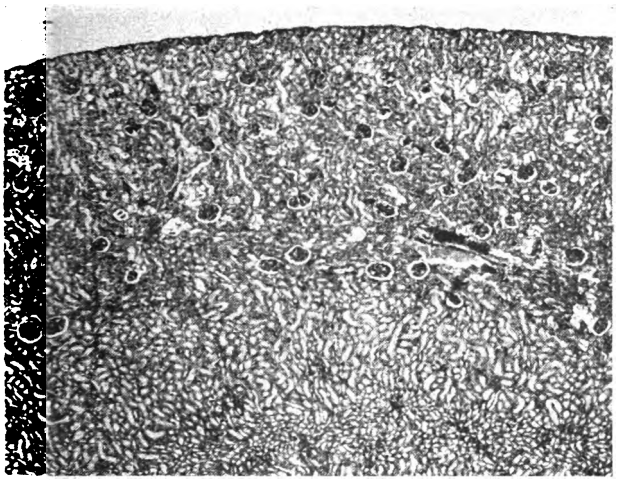

Fig. 1—Normal kidney of a rat of group 1 (receiving water to drink).

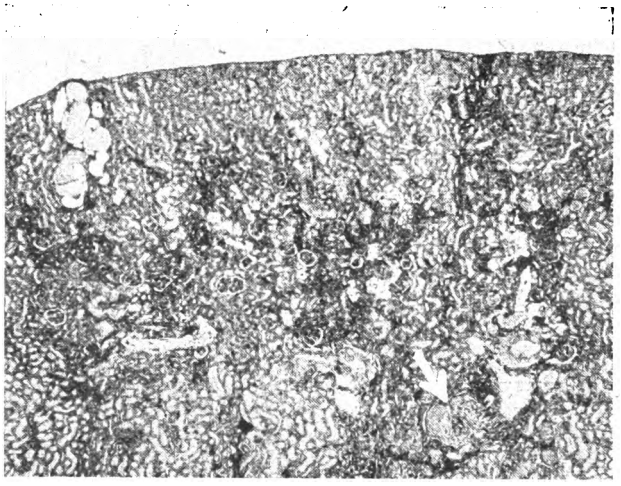

Fig. 2—Kidney of a rat of group 2 (receiving water to drink and treated with desoxycortone). Note numerous distended tubules, some filled with hyaline casts. The arrow points to an enlarged hyalinised glomerulus.

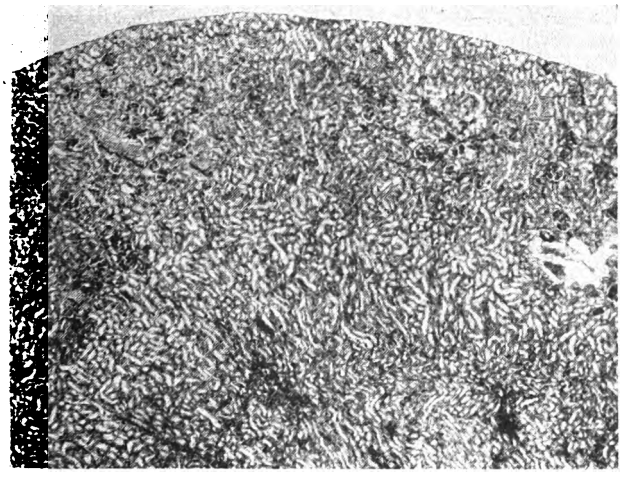

Fig. 3—Kidney of a rat of group 3 (receiving NH_4Cl solution to drink and treated with desoxycortone). Note absence of pathological changes, although tubules are perhaps slightly better developed than in fig. 1.

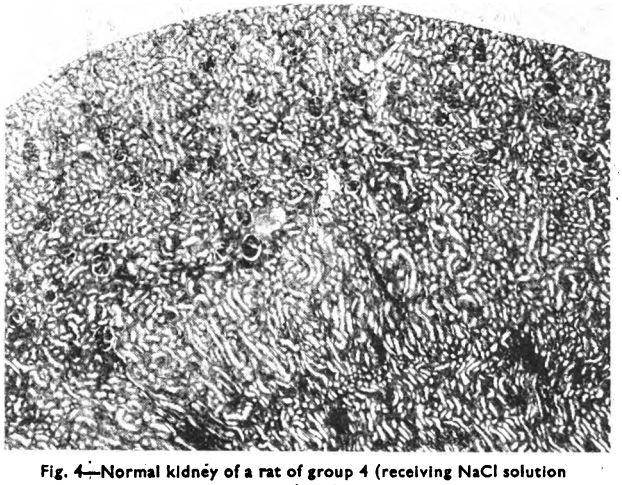

Fig. 4—Normal kidney of a rat of group 4 (receiving NaCl solution to drink).

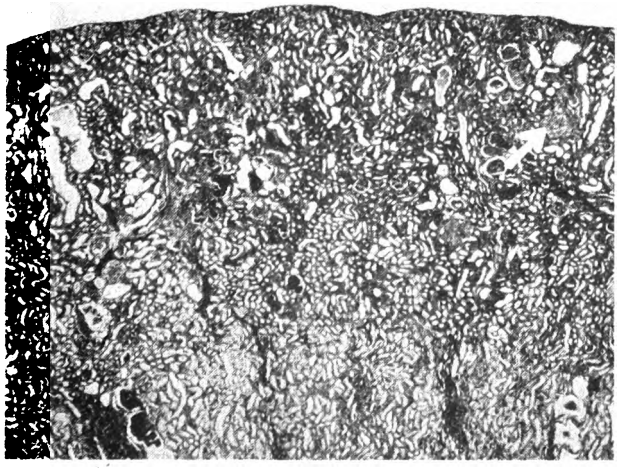

Fig. 5—Kidney of a rat of group 5 (receiving NaCl solution to drink and treated with desoxycortone). Note numerous distended tubules, some filled with hyaline casts. The arrow points to an enlarged hyalinised glomerulus. The changes are essentially the same as those in fig. 2.

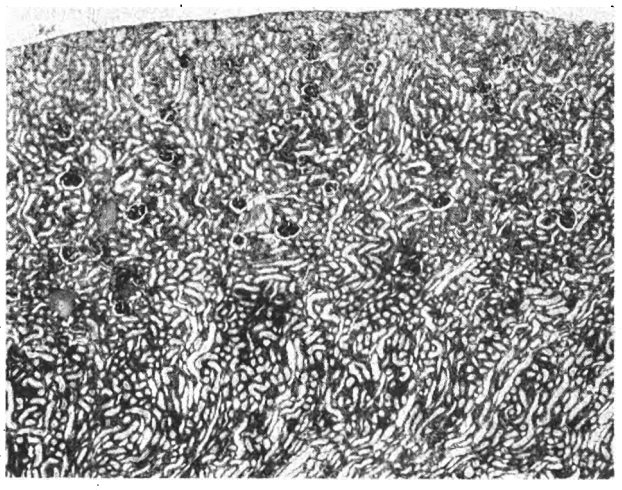

Fig. 6—Kidney of a rat of group 6 (receiving a solution of NaCl and NH_4Cl to drink and treated with desoxycortone). Note absence of pathological changes, although tubules are distinctly better developed than in fig. 4.

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their experiments the nephrosclerotic action of desoxycortone was not known. Hence they based their conclusions mainly on the presence or absence of cardiac lesions and the increase in the gross weight of the kidney.

Subsequently, Masson and Beland (1943) repeated these experiments in the mouse, again using renal enlargement as an indicator of desoxycortone overdosage. These latter investigators were unable to confirm the beneficial effect of KCl, inasmuch as treatment with this salt did not prevent the increase in gross kidney weight caused by desoxycortone. Since the mouse is comparatively resistant to the nephrosclerotic action of this steroid, these experiments—like those of Durlacher and others (1942) and Darrow and Miller (1942)—could shed no light on the possible beneficial effect of KCl as an inhibitor of desoxycortone nephrosclerosis. Blood chemical studies on the animals of the present series clearly indicate the lack of any correlation between blood-potassium and nephrosclerosis, in as much as ammonium chloride inhibits the latter without significantly altering the blood-potassium concentration.

We are tempted to ascribe the beneficial action of NH_4Cl to its acid-forming property. Yet it is not inconceivable that chloride ions, given in the form of salts other than NH_4Cl (e.g. KCl), would also be therapeutically effective, not because of their cation but because of their Cl content. Experiments designed to elucidate this point are now under way in this laboratory, but the therapeutic effectiveness of a chloride given as NH_4Cl suggests that the above-mentioned discrepancies are probably due to differences in interpretation rather than in the actual facts observed.

SUMMARY AND CONCLUSIONS

Experiments in the rat indicate that ammonium chloride is highly effective in preventing some of the most serious toxic effects of desoxycortone overdosage. Since there is good reason to believe that nephrosclerosis with renal hypertension, periarteritis nodosa, and perhaps also some of the manifestations of "rheumatic fever" are due to intoxication with excessive amounts of endogenous desoxycortone-like adrenal cortical substances it seems desirable to examine the efficacy of ammonium chloride in patients suffering from such diseases.

This salt may also make it possible to use desoxycortone more extensively as a therapeutic agent in adrenal cortical deficiency without incurring the danger of overdosage. Since this would be merely a new therapeutic application of a time-honoured remedy which has been used in large doses as an expectorant and diuretic, such therapeutic attempts may be undertaken without the usual preoccupation associated with a new drug.

The expenses of this investigation were defrayed by a grant received from the Josiah Macy, jun. Foundation. We are also indebted to Dr. E. Schwenk of the Schering Corporation of Bloomfield, NJ, who supplied the desoxycorticosterone acetate.

REFERENCES

Darrow, D. C., Miller, H. C. (1942) *J. clin. Invest.* **21**, 601.
Durlacher, S. H., Darrow, D. C., Winternitz, M. C. (1942) *Amer. J. Physiol.* **136**, 346.
Glendening, M. B., Winter, H. A., Williams, H. H., Abbot, W. E., Hirshfeld, J. W., Heller, C. G. (1944) 27th annual meeting of the Association for the Study of Internal Secretions, Chicago.
Masson, G., Beland, E. (1943) *Rev. Canad. Biol.* **2**, 487.
Selye, H. (1940) G. M. Piersol's Cyclopedia of Medicine, Philadelphia, vol. xv, p. 15.
— (1944) *Canad. med. Ass. J.* **50**, 426.
— Pentz, E. I. (1943) *Ibid*, **49**, 264.
— Hall, C. E. (1944) *Amer. Heart J.* **27**, 338.
— Rowley, E. M. (1944) *J. Urol.* **51**, 439.
— Sylvester, O., Hall, C. E., Leblond, C. P. (1944) *J. Amer. med. Ass.* **124**, 201.

ŒSTRONE SUSPENSIONS.—Œstrogens, being sterols, are relatively insoluble in water, and therefore have to be dissolved in oil for intramuscular injection. It has, however, been found possible to make a watery suspension of œstrone in microcrystalline form which remains stable for a considerable time and when injected intramuscularly has much the effect of implanting a number of very small pellets of the hormone. The suspension prepared by the Laboratories for Applied Biology Ltd., and distributed by Coates & Cooper, Ltd., under the name of 'Micryston,' is stated to contain 1 mg. of microcrystalline œstrone per c.cm., and the number of crystals per c.cm. is estimated as 2×10^6.

REACTION AFTER PNEUMOPERITONEUM TREATMENT

EDWARD ASLETT
MRCS, DPH, DTM & H
TUBERCULOSIS OFFICER, KING EDWARD VII WELSH NATIONAL MEMORIAL ASSOCIATION

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PNEUMOPERITONEUM has now become fairly generally recognised as a useful adjunct in the management of pulmonary tuberculosis. Its chief value is to enhance the effect of phrenic-nerve interruption by increasing the rise in the paralysed diaphragm (Clifford-Jones and Macdonald 1943). It may also be used to help to control tuberculous lesions immediately after parturition (Barnes 1939). Fowler (1941) considers that pneumoperitoneum alone may be of great value in certain types of bilateral disease.

Though the exact value of pneumoperitoneum has yet to be assessed, it seems likely that it will, for some time at any rate, be increasingly used. We feel therefore that any unusual occurrences during such treatment should be reported.

CASE 1.—A man aged 32. Admitted on March 30, 1943, with bilateral streaky and nodular infiltration, and large and small soft-walled cavities in the upper zone of the left lung. His general condition was only fair. After 6 weeks of strict bed rest there was little improvement and a pneumoperitoneum was induced on May 12 with 400 c.cm. of air. He had three refills, of 400, 500, and 600 c.cm., on May 15, 18, and 25, without any undue discomfort or distress. A fourth refill of 800 c.cm. was given on June 1 at noon. On June 3 at 8 PM he became extremely breathless, the pulse was rapid and weak, and he was distressed and anxious. Breath sounds were exaggerated on both sides, with free movement of the chest. He quickly became collapsed and pale with a sunken appearance and cold extremities, but without definite cyanosis. There were no symptoms or abnormal signs referable to the abdomen. The pulse became progressively more rapid and thready. Oxygen gave some slight relief. Morphine, however, was more effective and afforded some 4–5 hours' sleep during which the respiration and pulse became almost normal. The morphine was repeated with some effect later but he died on June 4, some 24 hours after the onset of symptoms.

CASE 2.—A woman aged 23. Admitted on May 24, 1943, with cavitation in the upper lobe of the right lung and some dense infiltration in the middle lobe; limited fibrotic disease in the upper third of the left lung. Artificial pneumothorax was attempted on the right side but failed because of adhesive pleurisy. Her general condition and the presence of contralateral disease prohibited major measures, such as right thoracoplasty. On Aug. 27 pneumoperitoneum was induced. Thirteen refills varying from 200 to 600 c.cm., according to the appearance on screening, were given. Her general condition showed some improvement, pyrexia lessened, and it was hoped that she might improve sufficiently to allow of major measures. On Feb. 25, 1944, she had a fourteenth refill of 250 c.cm. at 11 AM. On Feb. 26 at 6 PM she complained of slight dyspnœa. Air entry was good on both sides and there was no cyanosis. On Feb. 27 at 10 AM dyspnœa became serious, with distress and some cyanosis. Oxygen gave some relief, but morphine was required. The breath sounds were exaggerated on both sides and the pulse-rate was 160. The pulse grew faster and feeble and she died at 2 PM.

Unfortunately, permission to perform a post-mortem examination was refused in both these cases.

The reactions described appear to have been directly connected with the pneumoperitoneum treatment. It should be emphasised, however, that in both cases fairly widespread bilateral disease contra-indicated preliminary treatment by a phrenic crush. In case 2 the symptoms may have been due to a reduction of vital capacity, though the refill which precipitated them was small (250 c.cm.) and they did not come on immediately. There are many points of similarity in the two cases but it cannot be assumed that both the reactions were the result of similar pathological processes. If reduction in vital capacity was the explanation in case 1, cyanosis rather than pallor might have been expected; the signs were more suggestive of cardiac than of pulmonary embarrassment. Air may have

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escaped through the diaphragmatic hiatus into the mediastinum, though some emphysema in the tissues at the root of the neck would then be likely, as well as some dysphagia and perhaps a crepitant murmur synchronous with the heart-beat (Clifford Jones and Macdonald 1943).

We have treated 12 cases with fairly advanced bilateral disease by pneumoperitoneum without preliminary phrenic crush. One of these showed a striking improvement which has been maintained since his discharge from hospital and one showed temporary improvement. The others, apart from the 2 fatal cases reported, showed no change for better or worse and the treatment was eventually abandoned.

Pneumoperitoneum may carry a genuine risk in advanced cases with poor general condition. But this should not, we feel, discourage its use in selected cases, especially to enhance the effect of diaphragmatic paralysis where artificial pneumothorax has failed. Of 30 cases of this type treated by phrenic crush followed by pneumoperitoneum, 2 showed a sharp pyrexial reaction after induction and after each of two refills. In 2 others a benign peritoneal effusion developed which completely cleared when pneumoperitoneum treatment was abandoned. In the remaining 26 cases no untoward reactions were encountered.

REFERENCES

Barnes, J. (1939) *Lancet*, ii, 976.
Clifford-Jones, E., Macdonald, N. (1943) *Tubercle*, **24**, 97.
Fowler, W. C. (1941) *Amer. Rev. Tuberc.* **44**, 474.

PERIARTERITIS NODOSA
POSSIBLY DUE TO SULPHADIAZINE SENSITIVITY

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IN the following case of periarteritis nodosa the vascular lesions may have been induced by a hypersensitivity to sulphadiazine. The necropsy report is of special interest because the eyes were subjected to microscopic examination, and information on the ocular lesions in this disease is scanty.

CASE-REPORT

A private, aged 21, was admitted to the hospital on June 24, 1943, for circumcision. Seemed in good health; past history and family history irrelevant; no significant physical abnormalities noted. No laboratory work done before operation. June 26, circumcision was done with 1% procaine local anæsthesia. On the 30th there was a sudden rise of temperature to 101·8° F without apparent explanation. July 2, some dullness with diminished breath sounds and a few crackling râles at right base; sulphadiazine, 1 g. four hourly, started. July 3–4 signs of consolidation in rt. lower lobe; X ray on July 8 showed slight haziness in right base. Fever continued, reaching about 102° F daily. White cells 13,900 per c.mm. (adult polymorphs 62%, stab cells 19%, basophils 2%, lymphocytes 13%, and monocytes 4%). Transferred to the medical service on July 11; urine contained one plus albumin, 5–10 leucocytes, and 5–10 red cells per high-power field. Sulphadiazine discontinued on July 11 because of urinary findings and because fever did not respond; 60 g. had been given in ten days, and blood-level had reached 10 mg. per 100 c.cm. July 13, patient slightly œdematous; shifting dullness in abdomen. Heart did not appear enlarged; sounds of fair quality with reduplication of first sound; harsh sound to left of sternum, suggestive of pericardial friction; inconstant presystolic murmur at apex; pulmonary second sound accentuated and systolic murmur heard in this area. An X ray showed clearing of pneumonic process in right base; heart shadow larger than on previous film; transverse diameter of heart 15·5 cm., and of thorax 29·5 cm. Tender in left costovertebral angle. Urine continued to show one plus albumin, numerous white cells, occasional red cells, and granular casts. Red-cell sedimentation-rate 55 mm. per hour. Non-protein nitrogen 45 mg. per 100 c.cm. Electrocardiogram showed normal rhythm; no prolongation of P–R interval; P and T waves upright in leads 1, 2 and 3; P–4 and T–4 slightly inverted. Two blood-cultures negative. Appetite poor; constipated, breath foul. Temperature rose to 102° daily; no chills. July 16: red cells 2,800,000; Hb 65%; white cells 20,000 per c.mm. (52% adult polymorphs, 30% stab cells, 10% lymphocytes). A third blood-culture and urine negative. Urine showed

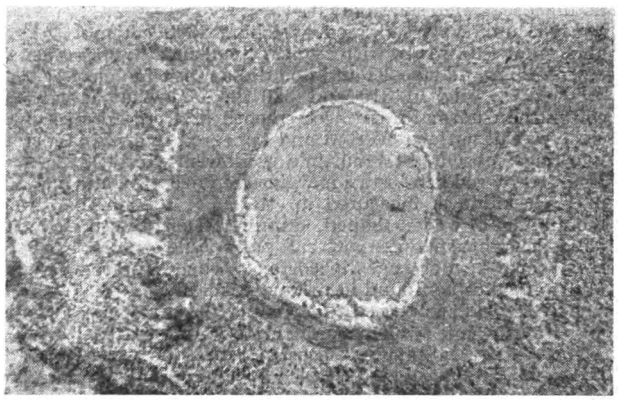

Fig. 1—Subpleural lung arteriole, showing lumen filled by a clot, coagulation necrosis of media, desquamation and disruption of the endothelium and internal elastic lamella, and an intense perivascular leucocytic infiltration (× 160).

increased albumin and more red cells. On July 20 differential count showed 5% eosinophils and on 25th 8% eosinophils; blood otherwise unchanged. Blood Kahn test negative and smear for malaria showed no parasites.

During this period patient was dull and depressed, with well-marked pallor. Fever, shifting dullness in abdomen, and varying murmurs at apex and base of heart continued. Lungs normal on physical examination. Ocular fundi normal on repeated examination. Blood-pressure 120/80 mm. Hg. Abdominal distention sufficient to require 'Prostigmin.' July 26, complaining of aching in extremities; no gross evidence of inflammation of joints; slight œdema over shins. Complained of inability to move left arm and hand. Reflexes normal. Received four transfusions of citrated blood at intervals of 4–5 days; liver extract and thiamine parenterally, intravenous dextrose solution, and digitalis in full doses. Developed nausea and vomiting and pulsus bigeminus; digitalis discontinued. Began to complain of severe pain in lower abdomen, which was much distended and tender. Liver and spleen never palpated. Urinary output remained good; urinary findings unchanged. Non-protein nitrogen 46 mg. per 100 c.cm. on July 22; carbon-dioxide combining power 42·8 vol. %; blood-chlorides 379 mg. per 100 c.cm; total plasma-proteins 6·52 mg. (albumin 4·4 mg, globulin 2·0 mg.) per 100 c.cm.

On Aug. 8 was very weak and pale but not complaining. Temperature a little lower. Muscles atrophied, flabby, and tender. No subcutaneous nodules felt. No heart murmurs now heard; heart enlarged to left. Pulse regular. Blood-pressure 140/110 mm. Hg, the highest reading during entire illness. During the latter part of morning began to cry out with pain in abdomen, and suddenly became cold, clammy, and grey. Within few minutes pulse and blood-pressure were not detectable and he died. Duration of illness 40 days, dating from onset of fever after circumcision.

NECROPSY REPORT

Gross examination.—Necropsy performed 1 hr. 20 min. after death. Body emaciated and complexion very sallow. Small lymph-nodes palpated in axillæ and groins. Œdema of hands, feet, and legs. No cutaneous nodules felt.

Abdominal cavity contained 500 c.cm. of pale clear fluid. Multiple greyish-pink firm movable nodules ranging up to 1 cm. in diameter studded entire mesentery; appeared to be enlarged lymph-nodes.

Straw-coloured fluid also found in both pleural cavities, 200 c.cm. in right and about 25 c.cm. in left. Lungs looked normal. Petechial hæmorrhages on both visceral and parietal surfaces of pericardium. Heart weighed 435 g., hypertrophied, and dilated. Epicardium smooth, glistening, transparent, and studded with petechiæ following courses of coronary arteries. Numerous soft and friable yellowish-white areas in myocardium, varied in size and shape, largest 1 × 0·5 × 3 cm. Endocardium overlying these areas dull, reddened, and covered with fibrinous material. No valvular defects noted. Coronary arteries surrounded by greyish-red

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nodular zones and lumina of smaller radicles seemed shrunken. Aorta showed early atheroma.

Spleen weighed 315 g., large and soft, greyish-red; capsule thin, tense, and smooth; cut surface everted and pulp dark reddish-purple with small irregular greyish-white streaks and nodules scattered throughout.

Liver uniformly enlarged, weighing 2060 g.; mottled red and yellowish-brown, with typical "nutmeg" appearance on cut section, and streaks and nodules as seen in spleen.

Kidneys weighed 310 and 320 g., somewhat larger and softer than normal; surfaces smooth and capsules stripped easily. Cut surface everted and appeared mottled; cortical markings obscured; multiple yellowish-white areas surrounded by reddish-brown margins seen in cortex and medulla of both kidneys, measured up to 1·5 × 1·9 cm. and were rectangular or wedge-shaped. Suprarenal cortex studded with yellowish-white nodules with soft and friable centres. Several small focal hæmorrhages in cortex of each suprarenal gland. Multiple petechiæ found in urinary bladder.

Arterial walls appeared thickened with narrowing of lumina and greyish-pink swollen periarterial zones.

Intestinal tract showed occasional areas of hyperæmia and few small shallow ulcers. Mucosa of cæcum deep red. Tip of appendix deep red, hæmorrhagic, and swollen; mucosa necrotic and bloody fluid filled lumen; serosal surface dull and lustreless.

Brain appeared grossly normal. Eye globes removed in toto and placed in 10% formalin.

Microscopical examination.—The significant lesion involved vasculature of practically all organs and tissues examined. Secondary lesions included thrombosis and infarction, aneurysmal dilatation with rupture and hæmorrhage, organisation and recanalisation with or without fibrosis, and resultant parenchymatous ischæmic necrosis. Coagulation necrosis, atrophy, and replacement fibrosis were also noted.

Lungs showed areas of œdema, hæmorrhage, engorgement, and dilatation of small venules and capillaries. Smaller arteries and arterioles showed thickening of walls caused by subendothelial increase of collagenous connective tissue. Others showed hyalinisation and fibrinoid degeneration of intima and media with reduplication, fraying, and disruption of internal elastic lamellæ. Intense inflammatory cell infiltration surrounded these arterioles, consisting of polymorph neutrophils, lymphoid cells, plasma cells, mononuclear phagocytic cells, and a goodly number of eosinophils. Muscle-fibres swollen, degenerate, and separated by œdema. Desquamation and disappearance of the endothelial cells and coagulation necrosis of the media involving the entire circumference of some of the vessels was seen (fig. 1).

Sections of *heart* showed multiple hyperæmic vascular scars, definite circumscribed areas of coagulation necrosis, and mural thrombosis with early organisation. Coronary arteries showed well-marked thickening of walls with narrowing of lumina, due to deposition of collagenous connective tissue and

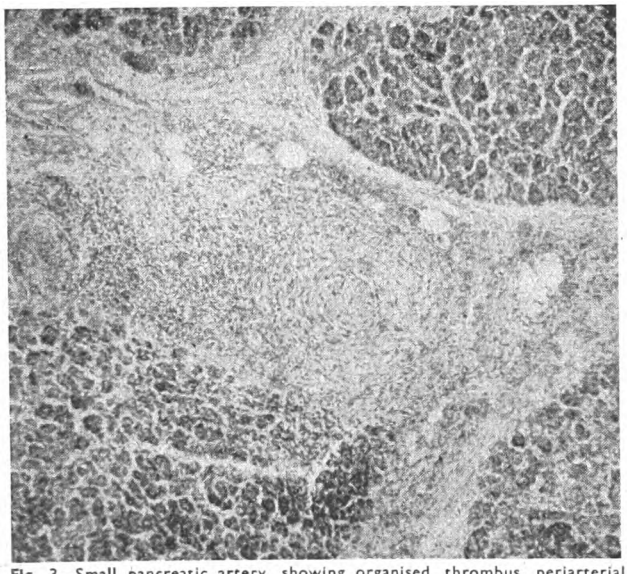

Fig. 3—Small pancreatic artery, showing organised thrombus, periarterial granulation tissue moderately infiltrated with leucocytes and degeneration of the media (× 160).

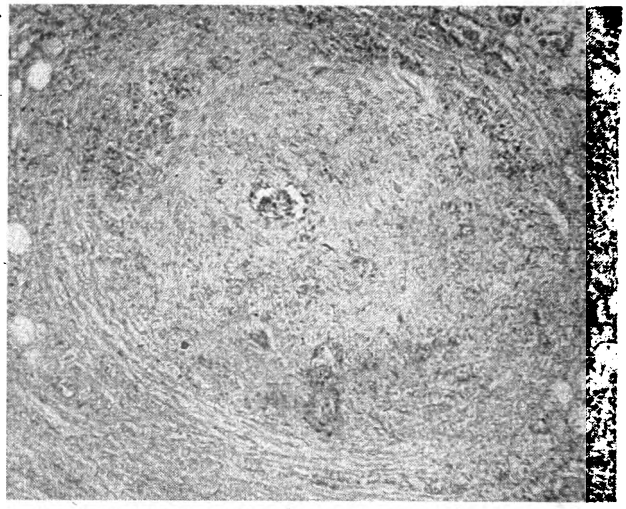

Fig. 2—Subendocardial coronary artery, showing periarterial fibrosis, recanalised thrombus and slight cellular infiltration (× 160).

fibroblasts as well as reduplication, fraying, and fragmentation of internal elastic lamellæ; well-marked periarterial inflammatory cell infiltration of all types of cells including eosinophils; fibrinoid degeneration, hyalinisation, and replacement of media by proliferated fibroblasts; formation of new capillaries and organisation and recanalisation of thrombi; obliterating endarteritis and marked periarterial fibrosis (fig. 2).

Kidneys showed areas of recent coagulation necrosis. Glomeruli diffusely swollen, avascular and cellular, containing increased numbers of polymorphs. Spaces of Bowman's capsules contained red cells, fibrin, and desquamated epithelial cells. Tubules degenerate and dilated. Cellular casts common and engorgement of interstitial vessels prominent. Interstitial cellular infiltration was focal.

Spleen: infrequent follicles; sinusoids engorged with red cells; pulp infiltrated with polymorphs, lymphoid cells, and eosinophils. *Liver*: advanced fatty and granular degeneration; focal atrophy and necrosis; general engorgement of small vessels, especially of central veins and adjacent sinusoids. *Pancreas*: arterial changes as elsewhere, including arterial fibrosis, interstitial and perivascular cellular infiltration, and parenchymatous degeneration (fig. 3).

Mesenteric nodes: engorgement of small vessels, reticuloendothelial hyperplasia, leucocytic infiltration, and proliferation of collagenous tissue in medullary portions; notable scarcity of germinal centres. *Appendix*: typical vascular lesions (fig. 4).

Skeletal muscles: perivascular leucocytic infiltration and degenerative changes of fibres.

Choroid vessels of eyes: minimal vascular lesions.

DISCUSSION

Gruber, in 1925, was the first to suggest that the pathological changes in periarteritis nodosa might be due to a hyperergic reaction in the arterial wall. There have since been numerous reports of people known to be allergic, and demonstrating such symptoms as asthma, who developed periarteritis nodosa (Speigel 1936, Ehrstrom 1938, Weir 1939, Cohen and Kline 1936), suggesting that the profound and permanent arterial changes are due to irreversible allergic reactions similar to the Arthus phenomenon. In many cases of periarteritis nodosa, however, no history of allergic diseases can be obtained.

The observations of Rich and his colleagues (1942a, b, 1943) have lent both experimental and clinical support to the allergic ætiology. In 1941 Rich encountered 4 patients who were treated for pneumonia with serum and sulphonamides, all of whom developed serum sickness and died. They all showed the lesions of periarteritis nodosa, and the following observations led to the belief that this was not a coincidence. First, none of the patients had symptoms suggestive of periarteritis nodosa before admission to hospital for treatment of the pneumonia. Secondly, all had an acute infectious disease, the pneumonia. Thirdly, the vascular lesions were fresh in all instances. Two cases showed fibro-

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blastic changes which were of 3–4 weeks' duration and coincided with the period that they were ill. Rich thought it extremely unlikely that the pneumonic infection itself was an ætiological factor. The view that serum sickness was the cause was supported by an autopsy on a patient who had died of serum sickness and had not received sulphonamides, but who showed the lesions of periarteritis nodosa. Rich also refers to the work of Clark and Kaplan on the vascular changes induced by serum sickness.

The case of a negro of 66 who was admitted to the Johns Hopkins Hospital for malignant ulcer of the scrotum suggests that sensitisation to sulphonamides may be responsible for the development of periarteritis nodosa. A biopsy 5 months before his admission showed no arterial disease. In hospital the patient received sulphathiazole before and after operation. Fever and a mild conjunctivitis developed on the 9th day and the drug was discontinued. However, apparently because of continued fever, the drug was again administered after a 5-day interval. The patient died on the 18th postoperative day. Tissues removed from the scrotum and inguinal lymph-nodes at operation showed no lesions suggestive of periarteritis nodosa, whereas those

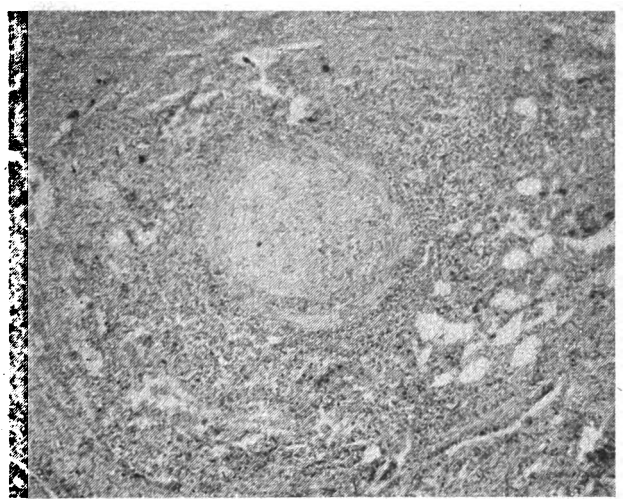


Fig. 4—Submucosal arteriole of appendix, showing organised thrombus, attenuation and degeneration of the media, and periarterial leucocytic infiltration (× 160).

removed at autopsy revealed extensive and pronounced arterial changes. A more perfect experiment could hardly be devised to demonstrate the cause and effect relationship between the drug reaction and the arterial changes. Its significance is diminished only because it is an isolated example.

Rich has reported that serum sickness in rabbits is accompanied by arterial lesions very similar to those of periarteritis nodosa. Thus far attempts to induce these vascular changes by the production of drug sensitivity in animals have failed, but further experimentation is in progress (Rich 1942a, b, Rich and Gregory 1943).

The present case possessed most of the cardinal clinical characteristics of periarteritis nodosa, but though the eyes were repeatedly observed ophthalmoscopically by several members of the staff no evidences of arterial disease were noted in the visible retinal arterioles. It appears from this case—and the autopsy findings supported the view—that ocular involvement is not a prominent feature of periarteritis nodosa.

The case-history and X rays of the chest suggest that this patient may not have been suffering from periarteritis nodosa before his febrile illness. The onset of the illness was not different from that of other cases of atypical pneumonia, which were common at the time. There is both clinical and X-ray evidence that his pulmonary lesion was improving during the second week of his disease. There was no antecedent illness suggestive of periarteritis nodosa. The changes in the lungs were less pronounced than in other parts of the body and there were no signs of any extensive vascular accident in the right lower lobe. It is at least possible that the arterial disease was a result of hypersensitivity to sulphadiazine.

Acknowledgment is made to the staff of the medical service of the Evacuation Hospital, on whose service the patient was initially observed. We are indebted to the First Medical General Laboratory and Lieut.-Colonel D. Murray Angevine for the microphotographs.

REFERENCES

Arkin, A. (1930) *Amer. J. Path.* **6**, 401.
Cohen, M. B., Kline, B. S. (1936) *J. Amer. med. Ass.* **107**, 1555.
Ehrstrom, M. C. (1938) *Acta med. scand.* **94**, 346.
Leishman, A. W. D. (1937) *Lancet*, i, 803.
Middleton, W. S., McCarter, J. C. (1935) *Amer. J. med. Sci.* **190**, 291.
Reimann, H. A., Price, A. H., Herbut, P. A. (1943) *J. Amer. med. Ass.* **122**, 274.
Rich, A. L. (1942a) *Bull. Johns Hopk. Hosp.* **71**, 123. (1942b) *Ibid*, p. 375.
— and Gregory, J. S. (1943) *Ibid*, **72**, 65.
Speigel, R. (1936) *Arch. intern. Med.* **58**, 993.
Weir, D. R. (1939) *Amer. J. Path.* **15**, 79.

Medical Societies

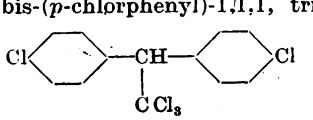
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE

THE insecticide DDT has received a great deal of publicity, but little of the scientific work on which its reputation depends has been published, at any rate in this country. On Feb. 15 Prof. P. A. BUXTON gave some details of unpublished British work.

DDT in Action

It is now about five years, he said, since the insecticidal powers of DDT were discovered in the laboratories of Messrs. J. R. Geigy, A.G., of Basle. Small samples reached England towards the end of 1942, and some of the early tests here were made in Buxton's department at the London School of Hygiene. The results were astonishing; DDT proved to be lethal to lice and bed bugs at a tenth or less of the concentration required of the thiocyanates, which were among the most potent synthetic insecticides then known. This discovery came at a welcome moment for the Allies, who were experiencing difficulties in obtaining insecticides for controlling insect-borne diseases. The entry of Japan into the war and the occupation of Malaya had deprived us of half the pyrethrum supplies and nearly all the derris: to make matters worse, the 1942 pyrethrum crop in Kenya was a poor one. To reach agreement on the conservation of pyrethrum supplies, a British mission, of which Buxton was a member, went to America early in 1943. DDT was produced as a possible alternative and it transpired that the Americans had likewise made preliminary tests with the same results. Subsequent collaboration between the two countries resulted in the production of DDT on a scale to meet the pyrethrum deficit. But DDT is more than a substitute; in some ways it is better than pyrethrum. Its chief virtues (apart from toxicity to insects) are chemical stability and physical inertia—in a word, its permanence. This contrasts with pyrethrum, which loses its insecticidal power rather easily in sunlight, especially when dispersed into small drops or thin films. On the other hand, DDT has one disadvantage in its slow speed of kill as compared with the rapid "knock-down" of pyrethrum.

DDT is a white crystalline solid with a faint pleasant smell. It is practically insoluble in water but dissolves in various organic solvents fairly readily. The initials DDT stand for dichlordiphenyltrichlorethane, or, more precisely 2,2 bis-(*p*-chlorphenyl)-1,1,1, trichlorethane;



If either of the end chlorines is moved into the *ortho* position, the substance becomes almost harmless to insects. Being nearly insoluble in water, DDT has very little smell or taste, so that one could eat large quantities without repugnance; therefore the question of toxicity to man is important.[1] Buxton's conclusion, based on a wide knowledge of its practical application, was that

1. See *Lancet* annotation, Feb. 24, 1945, p. 248.

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DDT as an insecticide is quite safe. There is no recorded case of human intoxication by DDT despite the thousands of soldiers who have worn impregnated shirts and the considerable number of factory hands concerned with its manufacture and application, on the scale of several tons a day. The substance can penetrate the mammalian skin when in concentrated solution, but cannot do so when dry. Insects however can be fatally poisoned by mere contact with DDT crystals. It is probably also toxic when swallowed by them but this effect is difficult to differentiate from the general poisoning by contact. The symptoms commonly shown by insects are twitching of the legs and lack of coördination; so they cannot walk or fly normally. These characteristic symptoms may persist for some hours before death. DDT has been found to be lethal to all types of insect on which it has been tested. But there may be wide differences in susceptibility. Simple tests in which half a dozen different insects were exposed to dry films of DDT on filter paper indicated a range of 10,001 : 1 in the doses necessary to kill.

For application, DDT can be made up as a powder, as a solution in kerosene or other liquids, or as a dispersion in water, or it can be dissolved in oil and the oil emulsified. The formulation is an important consideration in attacking different pests. For mosquitoes, DDT can be used either against the adult or the larva. For the adults, which are easily killed by it, DDT is a useful component of sprays and aerosols of various types. But perhaps the most promising method is to coat the walls of dwelling houses with a film of about 100 mg. per sq. foot which should remain lethal to mosquitoes for 2–3 months. This seems likely to be the most economical method of controlling malaria in native villages, and the consequences of its widespread use are enormous. In antimalarial oil DDT is toxic to mosquito larvæ at fantastically low rates. Under experimental conditions in West Africa, Buxton found that a tenth of an ounce per acre killed all larvæ (though it had no lasting effect). In practice, this dose has to be increased, to allow for poor distribution and to give some residual toxicity, to about 2–4 oz. Distribution of DDT dust by aeroplane is a novel and spectacular method but one which is of mainly war-time importance. Against houseflies and other muscids such as *Calliphora*, *Lucilia*, *Stomoxys*, and *Glossina*, DDT films are toxic for long periods, and this opens up new possibilities of their control.

For the control of body lice, DDT may be used either in the form of a dust (at 10% in an inert mineral) or to impregnate underwear. The dust was used on a large scale in the Naples typhus epidemic early in 1944 and the successful control of the disease is generally attributed to the insecticide. The simplicity and speed of application by puffing dust under the clothes without troubling to undress people enabled very large numbers to be treated, which was a big factor in the success of the treatment. But this rough and ready method would only be effective with a highly insecticidal dust. A great advance in the protection of armies in the field from lice has been made in this war by the impregnation of underwear with insecticides. DDT is admirable for this purpose, only 1–2% by weight of the garment being necessary. Owing to the insolubility of DDT in water, this "proofing" resists a considerable amount of wear with weekly laundering.

Looking forward to peace-time problems, Buxton said there are many domestic pests which can be attacked with this new insecticide. One of the foremost is the bed bug, which should be prevented from spreading into the new houses which will be built in the post-war years. So far the most promising method seems to be the general spraying of walls and furniture with a 5% solution in kerosene. The amount of DDT deposited should be at least 100 mg. per sq. ft. Field trials as well as laboratory work indicate that this deposit remains lethal to any bugs which may be introduced into a treated room for some three months. Further problems of improving the toxicity and permanence of these films await solution.

ROYAL SANITARY INSTITUTE.—At a meeting to be held at the Guildhall, Norwich, at 10.30 AM on Saturday, March 17, Dr. A. J. Macdonald will speak on food-poisoning.

Reviews of Books

The Surgery of Abdominal Trauma

GEOFFREY E. PARKER, MB CAMB., FRCS, surgeon, French Hospital, London, Woolwich War Memorial Hospital; major RAMC. (Churchill. Pp. 118. 10*s*. 6*d*.)

Major Parker describes 94 cases of abdominal trauma which he has himself treated. The histories are preceded by chapters on diagnosis, preoperative treatment, and general operative considerations, and followed by an account of postoperative treatment and a summary of his impressions. His reports give a stimulating picture of field surgery: something of the atmosphere in which the work was carried out lends colour to a series of useful and informative cases with the high recovery-rate of 66%. He advises that the proctoscope should be used as a routine where there are penetrating injuries of the lower abdomen and buttocks, and he gives useful suggestions for the placing of incisions for exploring the kidneys. The anæsthetist's work has been impressive in these cases, especially his success in maintaining respiration in patients too shocked to do it for themselves. The free use of morphine is considered essential although it may add to difficulties in diagnosis. Fuller discussion of these difficulties would have been welcome, since there is some reason to suppose that in the past they have been exaggerated. For the patient who is bleeding but not ready for operation a slow blood-drip is advocated, to be speeded up as soon as the operation begins. The view that bleeding patients need to have their blood replaced rapidly might have been discussed here; there is a growing opinion that if replacement encourages the bleeding, then the answer is more blood. The 5% glucose-in-water infusions suggested for extreme postoperative thirst might be used more generally; thirst is only one of the undesirable results of giving 5% glucose in saline—that is, about 30 g. of salt in 24 hours in hypertonic solution. This book should prove thoroughly useful.

Vascular Responses in the Extremities of Man

in Health and Disease. DAVID I. ABRAHAMSON, MD, FACP. (Oxford University Press. Pp. 412. 30*s*.)

WORK on the disorders of the peripheral circulation has advanced so fast in the last 15 years that many clinicians have had some difficulty in keeping pace. This comparatively small book, by a triumph of selection and compression, covers the whole field digestibly. The anatomy and physiology of the blood-vessels and their controlling nerves are described, methods of diagnosis are evaluated, and the effects of position, temperature, food, anoxia, effort, and many drugs are discussed in detail. All the known disorders of the peripheral circulation are mentioned, though in this section an elementary clinical knowledge of the subject is assumed in the reader. References are numerous. The book can be recommended to those who want a general review, and will be welcomed also by those who would pursue in detail the study of a single disorder.

Allergy in Practice

SAMUEL FEINBERG, MD, associate professor of medicine and chief of the division of allergy, Northwestern University, Chicago. (Year Book Publishers; H. K. Lewis. Pp. 798. 50*s*.)

Feinberg's 798-page volume is, as he wished to make it, a practical yet not dogmatic exposition of the subject of allergy, detailed enough to be useful yet not too verbose. The essential text is in type of normal size, while controversial matter is in smaller type—the former being suggested for the beginner, the latter for the specialist. The rôle of allergy in most of the specialties is stressed. Two sections are pre-eminent: an account, by Professor Feinberg himself, of allergy due to fungi, which he ranks among the commonest causes of allergic response; and a world-wide survey of the distribution of the important pollens producing hay-fever. Allergic diseases in man, anaphylactic conditions in animals, heredity and constitution, the various allergens, the technique of skin testing, and the preparation of extracts are all discussed, and clinical and therapeutic aspects are ably presented. References are ample and up to date.

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THE LANCET

LONDON: SATURDAY, MARCH 10, 1945

Protein in Illness

IN the treatment of grave and acute illness attention is usually focused sharply on the local lesion, and less notice is taken of the general disturbance of metabolism. But the light now being thrown on the intermediate metabolism of protein has demonstrated once again the significance of this background of disease; and our conception of the nutritional needs of the sick is changing. Hitherto the main object of doctors prescribing a diet has generally been to provide enough calories; and the fundamental importance of protein has often gone unrecognised. But, whereas deprivation of calories means little more than loss of unessential fatty tissue, deprivation of protein removes the factor needed for repair.

Recent studies of the effect of burns illustrate this importance of protein in the diet. Loss of protein after burns can be accounted for in various ways, the two widest channels of loss being local destruction of tissue (with its associated pathological changes) and a mysterious aggravation of katabolism. The greatest wastage is from the latter cause; it begins soon after burning and lasts ten days or more. TAYLOR et al.[1] have shown that with a diet of 3000 calories containing 50–100 grammes of protein the total deficit of protein over seven weeks may amount to 2 kilogrammes. It has been known for some time that breakdown of tissue is much accelerated after burning, but this phenomenon is not peculiar to burns; it is also seen after fractures (CUTHBERTSON [2]). In our last issue Mr. P. B. CROFT and Prof. R. A. PETERS showed that in burnt animals the nitrogen loss can be materially reduced either by giving a diet rich in protein or by adding to the ordinary diet a relatively small amount of the single sulphur-containing amino-acid, methionine. These findings lead them to suggest that trauma results in a clamant demand for methionine, which can only be met by breaking down tissue protein. The remaining unwanted amino-acids, becoming waste-products, are deaminated and excreted in the urine.

Verification of this feasible explanation of nitrogen loss will open up an attractive field for further investigations, which may be made from different angles. The importance of the amino-acids and their parent protein in conditions other than burns and fractures should not be overlooked. It is well known that increased loss of nitrogen is a constant feature of protein starvation from any cause, and the explanation of this may lie, as CROFT and PETERS suggest, in the utilisation of methionine for tissue repair or for detoxication. A more subtle chemistry may, however, be involved; for the variety of conditions in which raised protein katabolism has been observed is very considerable and is becoming greater as investigation extends. Co TUI et al.[3] have demonstrated a nitrogen deficit in patients undergoing gastrectomy and emphasise the necessity for maintaining a high intake of protein to correct this. In hæmatemeses and melæna a negative nitrogen balance with azotæmia is a constant finding which has never been quite satisfactorily explained, but it is clear that increased protein feeding by the Meulengracht regime or one of its modifications has wrought great improvement in the treatment of this condition. In hepatitis the importance of protein feeding has lately been recognised[4] and here again the essential rôle of methionine is apparent. There is thus a wide variety of conditions associated with destruction of body protein, and where this destruction goes unrecognised and untreated it is likely in time to lead to hypoproteinæmia—insidious in its development but serious in its effects. While therefore the recent advance in knowledge of amino-acids are of fascinating biological interest, they also emphasise in a practical sense a need for vigilance over the diet of the sick, and for more serious attention to the common symptom of anorexia. Failure to take food is only too often considered an unfortunate but inevitable accompaniment of disease. It should be regarded rather as a therapeutic challenge.

1. Taylor, F. H. L., Levenson, S. M., Davidson, C. S., Browder, N. C., Lund, C. C. *Ann. Surg.* 1943 **118**, 215.
2. Cuthbertson, D. P. *Brit. J. Surg.* 1936, **23**, 505.
3. Co Tui, Wright, A. M., Mulholland, J. H., Barcham, I., Breed, E. S. *Ann. Surg.* 1944, **119**, 815.
4. See *Lancet*, 1944, ii, 724.

The Dressing of Burns

FROM the earliest times surgeons entrusted with the care of wounds have followed two main schools of thought. There are those who advocate special remedies to be applied frequently, and those who leave the wound alone. The followers of the leave-it-alone school argue that Nature is well fitted to carry out repairs to damaged tissues, and requires only to be left undisturbed to perform her task. The more restless and curious members of the craft like to know what is going on beneath their dressings; how many and what varieties of organisms are present in the wound. And it can safely be assumed that even if their first examinations are negative the bacteriologist will eventually have material for his culture plates. MILES and his colleagues,[5] for example, showed early in the war how commonly additional bacteria will be found in a wound after a fortnight or so if serial swabs are taken; and MILES [6] has demonstrated by streptococcal typing that these organisms are added after wounding. Admittedly the mere finding of bacteria in a wound swab does not necessarily mean that the wound is clinically infected, but there have been plenty of instances of serious and even fatal infection introduced by repeated dressings. Moreover, as ACKMAN and SMITH [7] of Montreal point out, contamination is not the only consideration, for frequent dressing changes, particularly by inexperienced hands, may impair the vitality of tissues and interfere with repair processes.

The conservative school have lately received some additional evidence in support of their beliefs. DINGWALL and ANDRUS [8] were using experimental burns of a uniform type on human volunteers to compare the merits of different local applications. They compared each dressing with a standard "sulfafilm" (10% sulphanilamide with methyl

5. Miles, A. A., Schwabacher, H., Cunliffe, A. C., Paterson Ross, J., Spooner, E. T. C., Pilcher, R. S., Wright, J. *Brit. med. J.* 1940, ii, 855, 895.
6. Miles, A. A. *Lancet*, 1944, i, 809.
7. Ackman, D., Smith, F. *Canad. med. Ass. J.* 1944, **51**, 493.
8. Dingwall, J. A., Andrus, W. deW. *Ann. Surg.* 1944, **120**, 377.

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cellulose in a triethanolamine base). They found that as their experience and confidence in their technique increased so did the changes of dressings grow less frequent. At the conclusion of their experiment they could show that the average healing time of burns dressed five times was 13·8 days, whereas for burns whose dressings were changed only once the average healing time was 7·6 days. Their reasons for this difference in the rate of healing are worth quoting. "We feel the reason is twofold: first that removing any dressing, even when there is no obvious adherence to the burned area, undoubtedly disturbs and probably removes some of the extremely friable new epithelium. This occurs because the dressing tends to become incorporated in the lesion. Second, the factor of increased contamination which is cumulative with each dressing change may also interfere with the healing process." This policy of leaving dressings alone clearly depends on good primary treatment. In the case of wounds it means the removal of all dead tissue, so as to avoid bathing the healing tissues in a foul sloughing mass, and so as to reduce the more serious risk of gangrene. In the case of burns it is extremely difficult to remove dead tissue, and this remains one of the chief problems in the treatment of deep burns.

Normally a slough from a moderately deep burn separates in 10–20 days, the process being faster if much pus is present. CONNOR and HARVEY [9] have recently suggested a method for hastening separation. Believing the beneficial action of the pus to be due to its acidity, which increases over a number of days, they sought to hasten the process by lowering the pH in the lesion artificially. To do this they applied dressings of a paste made of starch and pyruvic acid solution at pH 1·9. Changing the dressings every 24 hours, they found in dogs that sloughs from experimental burns that took 10–12 days to separate under plain dressings were completely detached within 72 hours with the pyruvic acid dressing. Furthermore, the tissues underneath looked extremely healthy and skin-grafts placed on them took successfully. They had not then worked out the technique on human burns but reported favourably on a single case. If these claims can be confirmed they will go some way towards solving the problem of treating deep burns. The slough will be separating during the early days while the patient is throwing off the systemic effects of his injury. A few days later skin-grafting should be possible. It is generally agreed that escharotics, such as tannic acid, ordinarily delay the separation of sloughs. Because of this and its toxic effects on the liver, MCCLURE and his colleagues [10] in a paper from the Henry Ford Hospital, Detroit, where tannic acid therapy of burns was first introduced by E. C. DAVIDSON in 1925, tell of the abandonment of this form of treatment in favour of the occlusive pressure dressing. At home, too, the infrequent dressing has found favour; thus in the Glasgow burns unit [11] the primary dressing, after application of the sulphonamide cream, is left untouched for 7–10 or even 12 days unless the affected area is such that some contamination is unavoidable. Canada endorses this sound surgical principle, and ACKMAN and SMITH, from a controlled series of wounds and burns, conclude that healing and restoration of function are attained most rapidly with occlusive pressure dressings seldom changed. In their opinion no kind of bacteriostatic outweighs the advantages of non-interference.

9. Connor, J. G., Harvey, S. C. *Ibid*, p. 362.
10. McClure, R. D., Lam, C. R., Romence, H. *Ibid*, p. 387.
11. Studies of Burns and Scalds, *Spec. Rep. Ser. med. Res. Coun., Lond.* 1944.

Scrub Typhus

MALARIA and the dysenteries have always been, and still are, major medical problems in the military field in the tropics, though the campaigns in the East have demonstrated that they can largely be controlled by efficient sanitary measures, drug prophylaxis, and prompt drug treatment. But another disease has become of comparable importance under the conditions of jungle warfare. This is scrub-typhus, or tsutsugamushi, a rickettsial infection normally of small mammals and conveyed from one to another probably by several species of trombiculid mites. These mites feed on blood only once in their lifetime, during their developmental stage; otherwise they are vegetarians. A *Rickettsia orientalis* infection acquired by a larval mite at its blood meal on an infected rodent persists through the nymphal and adult stages of the female mite and is transmitted through its eggs to a succeeding larval mite. When this second mite takes its blood meal it retransmits the infection to a further vertebrate, which may be man. The method of inoculation, unlike that with louse-borne typhus, is by the actual bite of the mite, which presumably suffers from a septicæmic type of infection, the salivary glands among other organs being invaded by the organisms. The mites gain access to their prospective human hosts when the men are standing, sitting, or lying, either by day or by night, in infested localities; men moving and walking about are less prone to become mite-infested.[1] Scrub-typhus infection tends to be limited to particular areas of country; immediately adjacent localities may be relatively free from it. At the jungle edge near step-banked streams, for instance, scrub-typhus infection may be intense under suitable atmospheric conditions. A temperature of over 65° C is necessary before mites become active and can cause infection.

The host does not at first notice the presence of small mites on his skin, and they rapidly spread over his body. Within a few hours the attachment of many mites, whether infected with scrub-typhus or not, causes "scrub-itch," the mites remaining on the skin gorging for perhaps a couple of days. This scrub-itch varies in severity with the number of infesting mites and the individual reactions of the hosts to their bites. It may extend anywhere on the body and lasts four or five days. The scratching it provokes may result in a secondary infection of the abraded spots. But the incidence of scrub-itch is said not to be invariably synchronous with that of scrub-typhus; indeed on this account one worker [2] suggests that scrub-typhus may be transmitted by larval ixodid ticks. Probably all mites can cause scrub-itch, but those which do so most commonly are not necessarily vectors of scrub-typhus. The bite of a rickettsia-infected mite results in the appearance of a primary sore or eschar, which is found in over half the cases of scrub-typhus but not in all, enlargement of lymph-glands, and a maculopapular rash with fever

1. McCulloch, R. N. *Med. J. Aust.* 1944, ii, 543.
2. Cook, C. E. *Ibid*, 1944, ii, 539.

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lasting 16–20 days. The mortality from the disease varies. In 600-odd cases in New Guinea [3] between September, 1942, and September, 1943, it was 9·7%. In another series of 200 American cases in the S.W. Pacific area [4] it was 10%; but this figure was regarded as higher than necessary owing to the reluctance of men to enter hospital early. As in the classical louse-borne disease the mortality rises with advancing age.

The present exceptional opportunities for studying large numbers of cases of scrub-typhus have led to a clarification of our knowledge of the disease. Already several forms of supposedly tick-borne typhus—tsutsugamushi, Malayan scrub-fever or rural typhus, and Australian Q fever—have been shown to be mite-borne, and there is growing reason to suspect that much of the reputed tick-typhus encountered throughout India and the Far East is in reality the mite-borne disease, which has some characteristic features differentiating it from the louse-borne, flea-borne, and tick-borne forms, though all have much in common. A primary sore is often encountered in tick-borne and mite-borne typhus, in both of which infection results from the bite of the vector; this sore is absent in the louse-borne and flea-borne types, where infection results from the entry through skin abrasions of organisms present in the vector's excreta. A rash developing between the 5th and 8th days of the disease is common to all. In the flea-borne and louse-borne diseases the rash extends centrifugally but does not reach the face, palms, and soles. In the tick-borne disease the extension is centripetal; beginning on the wrists and ankles the rash spreads over the body, including the palms, soles, and scalp, being least definite on the abdomen and face. In the mite-borne disease the rash appears first on the abdomen and chest and extends centrifugally to appear on the face, palms, and soles. In each disease after a few days the rash begins to fade, and it finally vanishes in about a couple of weeks. In general the greater the intensity of the rash the more severe the disease. Common to all the typhus diseases are degenerative changes in the small blood-vessels, particularly those of the skin and central nervous system, with resultant vascular, mental, and neurological symptoms and signs. Toxæmia is profound in all; and each is associated with pulmonary complications. The febrile period in scrub-typhus ranges from under a week in the mildest cases to as long as 40 days in others. The great majority of cases run their course in from 10 days to about 3 weeks, 14–17 days being the most usual duration, while convalescence after an attack is protracted, as it is in the other more severe typhus fevers. In fatal cases the patient as a rule dies in the latter part of the second week.

The Weil-Felix reaction helps in the late diagnosis of scrub-typhus, but the *Proteus OXK* antigen for the test must be carefully chosen. With a satisfactorily agglutinable non-motile smooth strain of *Proteus OXK* the agglutinin curve begins to rise on about the 9th day of the disease and reaches its peak in another 10 days. In most cases it reaches a significant titre by the end of the 2nd week of the disease; 1/125 has been suggested as a safe minimum figure on which to base a diagnosis. High titres are often reached, a figure of 1/50,000 being recorded in the 3rd week of the disease in one case. The level of the agglutination titre however bears no relation to the prognosis in individual cases; some with very high immune-body response to OXK succumb to the disease, while others with little response may recover, and vice versa. Probably a more specific and satisfactory serological test will prove to be the examination of the agglutinating titre of the serum for rickettsial suspensions. These are less readily maintained and prepared than is the antigen for the Weil-Felix test, and so have been less used in the field.

The incidence of scrub-typhus among troops may be limited by pin-pointing the probable sites of infection of known cases and avoiding these areas. Methods of protecting exposed persons against the attack of mites are being actively investigated; clothing and blankets are being impregnated with insect repellants, such as dimethyl phthalate, which remain active for some weeks after one application. Finally there are good hopes of success with a vaccine now in preparation for the use of our Forces in the East. Treatment unfortunately remains purely palliative and symptomatic; absolute rest from the start of the disease, a liberal fluid intake, and the very best of nursing attention do much to aid the patient, whose recovery, given these, depends substantially on his own efforts. The present Australian and American workers in the field regard sedation as of prime importance and they use even morphine freely to secure rest. They also stress the importance of mental reablement after this debilitating fever—a point appreciated by the older physicians when epidemic typhus was much more general than it is now.

3. Williams, S. W., Sinclair, A. J. M., Jackson, A. V. *Ibid*, p. 525.
4. Lipman, B. L., Casey, A. V., Byron, R. A., Evans, E. C. *War Med.* 1944, 6, 304.

RATIONS AND RELIEF

IN discussing last week possible measures of relief for Europe, we said that Mr. Churchill had rejected the idea of reducing the rations of the British people. On reading *Hansard* it appears that the Government statements were less definite than this suggests. Opening the Commons debate on Feb. 27 the Prime Minister said:

> "I am not prepared to have this island cut below its minimum safety reserves of food and oil, except in cases where sure and speedy replacement can be made. Subject to this, we shall do everything in our power to help the liberated countries."

Speaking on the same day in the debate in the Lords on the needs of liberated Europe Lord Selborne said:

> "There is a generous wish among the British people, who know that they are better off than the liberated territories, to send food and other supplies, including rolling stock, from this country to France. Of course, we have done that and we are doing that, but I should be failing in my duty if I did not remind your Lordships and the public that Britain is fully mobilised, fighting the war, and we cannot part with more than a certain part of our resources without impairing our war effort. . . . It is a fact that everybody in this country has had sufficient but nobody has had too much, and the truth is that there is not too much in this country . . . and therefore the quantity of supplies that can be taken from these islands is necessarily very limited."

Sir ALEXANDER HOOD, director-general of Army Medical Services, will deliver the Harveian lecture of the Harveian Society of London at the Royal College of Surgeons, Lincoln's Inn Fields, WC2, on Monday, May 28, at 3.30 PM. His subject is to be Total Medicine.

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Annotations

COUPONS FOR BELTS

ANYONE needing a surgical belt or corset more than 6 inches wide must send with his order a medical certificate, which is reasonable, and three clothing coupons, which is an unjust and unkind imposition. In the early days of clothes rationing most adults had a store to draw on, but in five years seats and elbows wear thin and renewals become a necessity. Most of us now need all the clothing coupons we have got, and if coupons have to go on surgical apparatus we must be that much colder or shabbier. Wearers of abdominal belts, moreover, are likely to need more than the average of new clothes, for they often cannot move actively about to keep themselves warm, and some—those with colostomies or other fistulæ—have special needs because soiled underwear must be changed and laundered frequently. Three coupons may not seem worth mentioning. But belts must be cleaned and repaired, processes which now take weeks instead of days; hence few wearers can manage with a single belt—most need two, and some need three, and the efficient life of a belt is not much more than a year. It is then 6 or 9 coupons that these people may be docked in their first year—unless they are wily and lucky enough to manage with belts 5¾ inches wide—and 3 or so in subsequent years. As a final injustice belts with pads or chutes are exempted from purchase tax, but if the surgeon orders his patient with severe diverticulosis a belt with no pad the patient will be heavily taxed.

The Board of Trade argues that many surgical belts will serve well as cosmetic corsets, and a mere medical certificate will not stop the keen coupon-saver from taking advantage of any relaxation in the sick man's favour. This may be good reason for insisting (as the Board already insists) on detailed certification, but not for adding annoyance and often real hardship to the lot of a large class of chronic sick.

COLD-AGGLUTININS

WITH proper technique cold-hæmagglutinins can be demonstrated in low titre in almost all normal sera. High titres can often be found in atypical pneumonia, and have been reported in many other conditions, though, especially in the earlier reports, there was confusion between rouleaux formation and true agglutination of red cells. Stats and Wasserman[1] have set out three criteria for cold-agglutination in a given serum—(1) agglutination of red cells of any group and some non-human cells, such as sheep cells, at low temperatures with complete reversal on heating to at most 25° C; (2) complete absorption of the agglutinins with red cells at low temperatures; and (3) release of the agglutinins from cold-agglutinated erythrocytes by raising the temperature to 37° C. Not many reports fulfil all these criteria; nevertheless a good deal has been learnt from them. Cold-agglutination occurs mainly in acute infectious diseases, blood diseases, some parasitic diseases—notably trypanosomiasis—and cirrhosis of the liver. In the infectious cases, acute hæmolytic anæmia, and some cases of chronic hæmolytic anæmia, cold-agglutinins in high titre are only present for a limited time; they appear to be permanently present in some other chronic cases of hæmolytic anæmia, in cirrhosis of the liver, and in some patients with Raynaud's phenomenon. Of the acute infectious fevers, apart from atypical (virus) pneumonia, cold-agglutination has been noted in a few cases of scarlet fever and tonsillitis. Recently Spingarn, Jones, and Owrutsky[2] reported it in infectious mononucleosis, Viswanathan and Natarajan[3] in tropical eosinophilia. The case of paroxysmal hæmoglobinuria needs special mention. Stats and Wasserman point out that cold-hæmagglutination, even when associated with hæmoglobinuria, is not related to the paroxysmal cold hæmoglobinuria of syphilis; they are only superficially similar because cold activates the antibody in each; cold hæmagglutination cases do not give the Donath-Landsteiner cold hæmolysis reaction. In Raynaud's phenomenon there does seem to be an association between the clinical findings and cold-agglutination, since agglutination causes further retardation or even cessation of flow in the already constricted blood-vessels.

It will thus be seen that unusually high titres of cold-agglutinins in the serum occur in several unrelated conditions and will probably be found in more, if sought for. Has this any clinical importance? From an exhaustive study Stats and Wasserman concluded that apart from a few cases of hæmolytic anæmia and Raynaud's phenomenon, cold-agglutination is no more than a laboratory curiosity. This opinion was supported by their inability to show that cold-agglutinins caused any injury to the red blood-cells.

1. Stats, D., Wasserman, L. R. *Medicine, Baltimore*, 1943, **22**, 363.
2. Spingarn, C. L., Jones, J. P., Owrutsky, B. *Nav. med. Bull., Wash.* 1944, **43**, 77.
3. Viswanathan, R., Natarajan, B. *Lancet*, Feb. 3, 1945, p. 148.

COMMUNITY CENTRES

BRITISH Islanders vary considerably in sociability. Thus Hebrideans like to gather for a ceilidh, while Londoners prefer to keep themselves to themselves. Some villages offer a mad round of concerts, bazaars, and tennis parties; others are a cluster of hermitages. No doubt these differences are dictated in part by the disposition of the inhabitants, but it is also true that in some places the sociable are frustrated by lack of a place to meet each other. They are then driven to make a kind of club of the local public-house, where they stand or sometimes sit, often in drab surroundings, to drink thin war-time ales ungraced by any nourishment, physical or spiritual. The Ministry of Education wishes to see these friendly ones provided for more comfortably, and a report,[1] prepared under the direction of the Minister (though he does not commit himself to every detail in it), recommends education authorities to provide community centres where people can use their leisure well and pleasantly in the company of their neighbours. Much evidence has been taken on the need for such centres, on the methods of running those which already exist, and on the difficult problem of making them self-supporting.

Two kinds of centres are to be found at present. In one type a building or group of buildings provides a meeting-place for unrelated organisations. In the other type, a community association runs the centre, which is used chiefly as a club. The Ministry believes a good centre should serve both needs, catering not only for the gardening society, the bowls club, and the discussion groups, but also for the general social life of the neighbourhood. The report discusses early the importance of the canteen. All witnesses agreed that people like the opportunity of getting light meals in pleasant surroundings, and that this encourages them to use the centre for other purposes. But it must be a competent canteen if it is to be attractive; and though it may depend for much of its success on the voluntary efforts of members, the report suggests that the paid staff should include someone who has the job of running it. Opinions of witnesses differed when the question of a licence to sell alcoholic drinks was raised. Some thought a bar would lower the tone of the place, and attract those who came merely for a drink; others felt that a centre which combined the village hall and the village pub would be ideal. The report sensibly remarks that it is for the community concerned to decide whether they want a bar or not.

A full-time paid warden is needed for any centre which serves not less than 2000 families, as well as a

1. Community Centres. HM Stationery Office. Pp. 40. 9*d*.

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caretaker, a cleaner, and the canteen manager. Some clerical help may be needed too. The qualifications for a warden are noteworthy: it is not the brilliant dominating figure, the life-and-soul of the party, who makes a good warden, but the "patient fellow, not too anxious to lead, but willing to allow local interests to develop." These interests will include not only drama, hobbies, social evenings, and other forms of recreation, but educational activities, in the form of lectures, discussion groups, and demonstrations. Poultry and rabbit clubs and an allotment section may prove popular, but it is for members to decide what form their activities are to take. Opportunities for outdoor games such as tennis and bowls will be welcome, though this must depend on the site.

As to the cost, the report suggests that education authorities should survey the needs of their areas and include proposals for community centres in their schemes for further education under the Education Act. Once the centre is built, income will be derived from lettings, canteen profits, subscriptions, and profits on dances, whist drives, and other social functions. The education authority will usually contribute towards maintenance and half their expenditure is covered by the Ministry. The report suggests that the authority should meet the warden's salary and the costs of structural maintenance, but that members of the centre should make "the maximum contribution compatible with the general standard of their incomes" towards the cost of running it.

PEPTIC ULCER AND CAFFEINE

THE dyspepsia often associated with over-indulgence in tea has commonly been attributed to the astringent and ferment-precipitating properties of the active tannins always present in the cup. But half a pint of strong tea may easily contain 2 grains of the alkaloid caffeine, which forms the basis of the familiar euphoria and relief from fatigue. Excessive tea-drinking might therefore aggravate some psychosomatic factors of accepted importance in the evolution of chronic peptic ulceration. The local action of caffeine has been studied in many countries—sometimes revealing perplexing inconsistencies. For example, Pincussohn in 1906, using the Pavlov-pouch method in dogs, found that coffee increases the volume and acidity of the gastric secretion; but 22 years later Goldbloom employing the same method could not observe any secretory change whatsoever when caffeine was substituted for crude coffee. The subject is of serious import not only in this country of habitual tea-drinkers but also abroad. It was estimated in 1912 that an average of 10 lb. of coffee and 1 lb. of tea were used annually per head in the United States. The corresponding dose of pure caffeine would be about 2 ounces per person, which would mean an even greater consumption among the adults of the community.

In Chicago Roth, Ivy, and Atkinson [1] have modified the traditional caffeine test-meal technique and have measured not only the rise in gastric acidity but also the total volume of acid secreted. In "normal" subjects caffeine consistently provoked a rise in acidity, volume, and total acid, the increased secretion continuing for about 40 minutes. In ulcer patients the same effect in greater degree was noted, and the increased rate of secretion continued unabated for 2 hours or more. They regard this prolongation of response as characteristic of the action of caffeine in ulcer or ulcer-predisposed people and found it much more pronounced than the lengthened response following alcohol. The mucosal changes induced in the stomach have not been recorded in man, but well-marked hyperæmia of the mucosa followed by cyanosis has been seen in cats receiving caffeine intravenously or by mouth. The addition of caffeine in suitable form to a cat's daily food soon causes widespread gastric ulceration,[2] but not of a type reminiscent of the chronic lesion in man. By the alternate administration of caffeine and histamine such ulceration can be induced in a few hours, histamine being ineffective when given alone. Dragstedt [3] has drawn attention to a cognate synergism in man. He observed that the total secretion of acid provoked by histamine and caffeine in combination is much greater than the sum of the two separate responses. When the action of caffeine is compared with that of actual beverages it is apparent that caffeine is not the sole secretogogue involved. So-called decaffeinated coffee, and even substitutes prepared from roasted cereals, cause similar outpourings of acid, smaller in amount but nevertheless commensurate with the caffeine response. The coffee effect itself probably represents the combined actions of caffeine and of stimulant principles present in the coffee oil, responsible for much of the flavour and aroma. Coffee contains about 15% of oily matter, a mixture of higher fatty acid compounds and lipoid-soluble constituents. After roasting, this oily portion, now called "caffeol," contains considerable amounts of the cyclic aldehyde furfurol, together with irritant pyridines, some valerianic acid, and other compounds.

It has been suggested that alcohol produces its effect on the stomach indirectly by releasing histamine. The same view might be taken of the action of any agent capable of inflicting microchemical trauma, such as the irritant principles of condiments, and the idea could be extended to cover many of the odd constituents of the tea-coffee group of beverages. Whatever their explanation, if the findings and deductions of Roth and his colleagues are accepted, patients with persistent or relapsing peptic ulceration should be advised to restrict their caffeine-containing drinks, to avoid especially any simultaneous use of caffeine and alcohol or condiments, and to be sparing even in their consumption of coffee substitutes.

1. Roth, J. A., Ivy, A. C., Atkinson, A. J. *J. Amer. med. Ass.* 1944, 126, 814.

PATHOLOGY OF CONCUSSION

RECENT years have brought a fuller understanding of the nature of concussion. The careful work of Denny-Brown and Ritchie Russell [4] showed that, in animals, concussion might be unaccompanied by any gross pathological changes; and that, judging by the functional changes observed, the condition was due to transient paralysis of centres in the medulla oblongata. From their negative histological findings, they went so far as to suggest that these functional alterations were unaccompanied by any structural changes in the neurones. The disseminated petechial hæmorrhages, often linked with the name of Duret, who stressed their importance in concussion, must therefore be regarded as an additional and unessential feature resulting from severer grades of trauma. Investigation of the more subtle pathological changes occurring in neurones, particularly the finer shades of chromatolysis, needs rigorous controlling, and obviously—since cadaveric changes also involve chromatolysis—the experimental method is essential. These conditions are fulfilled in a study by Windle, Grant, and Fox [5] who found, in guineapigs, that varying grades of chromatolysis were demonstrable in the tegmental region of the brain-stem, and in the spinal cord. The cells most constantly affected were the large neurones of the red nucleus, and the lateral vestibular nuclei; the basal ganglia and cerebellar cortex were not altered. But the cells of any one group were not equally affected, and the number of neurones lost in post-concussion was probably only a fraction of the number

2. Judd, E. S. *Bull. Amer. Coll. Surg.* 1943, 28, 46.
3. Dragstedt, C. A., Gray, J. S., Lawton, A. H., Ramirez de Arellano, M. *Proc. Soc. exp. Biol. NY*, 1940, 43, 26.
4. Denny-Brown, D., Russell, W. R. *Brain*, 1941, 64, 93.
5. Windle, W. F., Grant, R. A., Fox, C. A. *Surg. Gynec., Obstet.* 1944, 79, 561.

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functionally altered at an earlier stage. In one of their control groups the animals were asphyxiated and revived, while in another group hemisectio nof the upper cervical cord was performed. In these groups the resulting chromatolysis in the affected neurones was found to differ from that observed in concussion, both in character and in the time of onset. Petechial hæmorrhages were found only with the severer grades of trauma. Moreover there was no œdema of the brain and no glial reaction in the later stages after concussion.

The localisation of these chromatolytic changes in concussion thus agrees well with the observations of Denny-Brown and Ritchie Russell on the functional disturbance. It may be supposed that, with slight degrees of concussion, the alterations in the neurones are correspondingly trivial and reversible. Severer grades of injury will result in proportionately heavy damage to the neurones, with the ultimate loss of some of them. The frequent complaint of post-concussional giddiness, and sometimes tinnitus, without demonstrable clinical signs is also explained. Lastly the suggestion made by Jefferson [3] that the brain-stem has a good deal to do with the control of consciousness receives further support.

INFECTION FROM DUCK'S EGGS

IN his annual report for 1926 the chief medical officer of the Ministry of Health drew attention to the possibility that improperly cooked duck eggs could cause gastro-enteritis. This warning has been repeated many times, and W. M. Scott [4] described several salmonella outbreaks in which duck eggs caused severe and often fatal infections. *Bacterium aertrycke*—or to give it its proper title, *Salmonella typhi-murium*—has caused most of the trouble, but other salmonella types may act in a similar way. Gordon and Buxton [5] have helped to close another link in the chain of evidence against the duck. They describe a case of gastro-enteritis in a man who had a fried duck egg breakfast and died six days later. *Bact. aertrycke* was found in his blood and fæces. Three of the four ducks which supplied his eggs gave serological evidence of *Bact. aertrycke* infection, but the results were variable. Of 16 eggs laid by the ducks, 3 contained the organism; it was isolated 3 times from both yolk and shell, from the ovaries of 2 of the ducks, and from the intestinal tract of the third. There is good evidence, therefore, that the fatal illness and the duck egg breakfast were related to each other; phage-typing of the duck and human strains of *Bact. aertrycke* might have clinched it.

If there is no longer reasonable doubt about the occasional contamination of duck eggs there are still interesting questions to answer. Why, for example, should this particular type of salmonella be apparently so common among ducks while relatively few of the numerous other types are reported? Gordon and Garside [6] suggest that fluctuation in the agglutinins for *Bact. aertrycke* of duck sera is associated with ovarian activity; and ducks appear to have the antisocial habit of intermittent excretion of the organism. Are ducks the only birds, domestic or wild, in this country which commonly transmit salmonella infections to man? The hen suffers from infections caused by a considerable number of salmonella types, and recent American work has shown that large epidemics of salmonella infections also occur among turkeys. Wood-pigeons, pheasants, and other birds are also occasionally affected. It is important to ascertain what part domestic fowls play in the spread of these infections and of the many new varieties of salmonella which lately appear to have come to stay with us. There is common ground here for the public-health and veterinary pathologist, and it may well be that the domestic duck will soon have new company in the dock. Meanwhile there is something to be said for the German law which compels duck eggs to be indelibly stamped as such, and for the advice that they should be boiled for at least eight minutes or thoroughly baked.

3. Jefferson, G. *Brit. med. J.* 1944, i, 1.
4. Scott, W. M. *J. Path. Bact.* 1932, **35**, 655.
5. Gordon, R. F., Buxton, A. *Bull. Min. Hlth emerg. publ. Hlth Lab. Serv.* February, 1945, p. 46.
6. Gordon, R. F., Garside, J. S. *J. comp. Path.* 1944, **54**, 61.

PENICILLIN-ALBUMIN

IN their work on administration of penicillin by mouth, Harwood Little and Lumb [1] found that if penicillin is dissolved in raw egg it will withstand changes of hydrogen-ion concentration which will seriously affect penicillin dissolved in plasma or milk and will destroy solutions in water, saline, or cholesterol. In studying the efficiency of various penicillin mixtures given by mouth after a dose of alkali they concluded that a penicillin-egg mixture was the best; and, in their early experiments at least, it seemed that the blood-serum remained bacteriostatic longer after such a dose than when penicillin is given intramuscularly. We now learn that, at the Squibb Institute in New Brunswick, Chow and McKee [2] have shown that, unlike sulphonamides, penicillin, combined with human serum-albumin, retains its antibiotic activity. The penicillin-albumin mixture can be precipitated in 50% alcohol and thus freed from unbound penicillin, which dissolves. The compound can then be redissolved in water and finally obtained in a dry powder. When given intramuscularly to mice it was more slowly excreted than sodium penicillin. Studies of its stability in acids and alkalis have not yet been published, but from the observations of Little and Lumb we may hope that it will prove more resistant than ordinary penicillin to changes of pH such as it would encounter when given by mouth.

LIBRARY HOSPITALITY

TILL the beginning of this year the Royal Society of Medicine placed a limit on the number of times outside visitors were allowed to use its library at 1, Wimpole Street, London, W1. As an experiment, it has temporarily relaxed this restriction, and a room on the second floor has been set aside for the use of visitors, with a member of the staff in attendance to fetch the books and documents they want. Many doctors and scientific workers who need the occasional help of the library have been glad of this facility, and at least until the beginning of June the society will continue its generous policy of the open library door.

The annual meeting of the Association of Surgeons of Great Britain and Ireland will be held at the Royal College of Surgeons, Lincoln's Inn Fields, London, WC2, on Wednesday and Thursday, May 2 and 3. The two main subjects of discussion will be the education of the surgeon (openers: Prof. Ernest Finch, Prof. J. R. Learmonth, Prof. John Kirk, Prof. W. G. Barnard, and Major-General W. H. Ogilvie) and carcinoma of the recto-sigmoid (openers: Mr. R. Scott Mason, Dr. Cuthbert Dukes, and Mr. O. V. Lloyd-Davies).

1. Little, C. J. H., Lumb, G. *Lancet*, Feb. 17, 1945, p. 203.
2. Chow, B. F., McKee, C. M. *Science*, Jan. 19, 1945, p. 67.

An advance party of UNRRA personnel has arrived in Yugoslavia as part of a mission to Yugoslav relief authorities. Military-liaison relief supplies are arriving on the Dalmatian coast, and about 150 tons (95% food and the rest medical stores and clothing) entered the country in the first half of February. The United States government is allowing the release of a limited amount of shipping to UNRRA for transporting civilian relief supplies for Italy, Czechoslovakia, and Poland. In Czechoslovakia these supplies will be issued by the government, under whose direction an UNRRA mission will work.

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Special Articles

FRANCE TODAY

(FROM OUR SPECIAL CORRESPONDENT)

(*Concluded from p. 283*)

THE black-market trade in food in Paris is being very vigorously fought; but with limited supplies and the distribution of an insufficient ration of necessities it is a very hard battle And the French peasants are more and more unwilling to sell their produce except at very high prices, for they find it difficult to buy any of the consumer goods they require. It is rumoured that many peasants, and many people operating in the black market, have such large collections of 1000-franc notes (worth £4 at the fixed exchange) that they do not reckon them in numbers but by weight in kilogrammes.

What part the black market plays in supplying the ordinary needs of ordinary workers in Paris is not at all easy to estimate. But a man is not debarred from buying in the black market because he has a low monthly wage or salary. In fact many people go into the black market as sellers in order to be able to meet their requirements as purchasers. If anyone in Paris can get supplies of food from the country districts by any means—such for instance as being the friend of a motor-truck driver or a railway employee—he can sell anything he has to offer at black-market prices. The underground channels of black-market trade were very useful during the German occupation. Channels of that trade, whether the same or new ones I do not know, certainly exist now.

When such elementary human needs as fresh food for small children—e.g., eggs and milk—and potatoes and vegetables for ordinary household consumption can only be got under the black-market counter, the incentive to make these purchases is as strong as human motives can be. Hence black-market trade is not by any means one which supplies luxuries only. Luxury restaurants giving illicit meals at fantastic prices can be closed. Night-clubs can be closed. But it is not possible to close all the avenues of trade by which a mother or father wanting to supply his family will seek to get necessary food, fuel, or clothing. Black-market trading is simply trading at inflated prices because commodities are so scarce and human need so great. The pressure of inflation on the French currency so caused is very grave. The fixed Anglo-French rate of exchange is 200 francs to the £, but the *bourse noire* rate goes up above 600 francs. Pounds and dollars are preferred by many French people to 1000-franc notes. The danger of serious inflation is a real one, with all the consequences of economic disorganisation which might follow.

For these economic reasons, which would have big repercussions on this country, as well as because of the physical needs of the French people, relief and rehabilitation measures are urgently needed on a very large scale.

Sampling Nutrition

It is so hard to discover the conditions in France by a study of statistics that I made some random samplings of groups of population, by personal inspection, to try to get a clearer idea of the actual state of affairs.

One random sampling was a visit to a school. The school was chosen for me by an official of the Department of the Seine according to my request that it should be not a very good school and not a very bad school, but just a quite ordinary school. I trusted my friend to be impartial in his choice, and to the best of my belief he was.

The school chosen was in a part of Paris in which there was a mixed population of middle-class and manual workers. It was a school having a thousand pupils, boys, girls, and infants, and I visited it at the time when a school meal was being served.

The week's menus of the meal are shown below.

Jan. 22: Potage crémosine; pâtes; fromage.
Jan. 23: Potage crémosine; œufs; pommes-de-terre en salade; biscuits.
Jan. 24: Potage crémosine; légumes divers braisés; fromage.
Jan. 25: Potage légumes; légumes divers braisés; confiture.
Jan. 26: Potage légumes; bœuf braisé, haricots.
Jan. 27: Potage légumes; bœuf bourguignon, pommes purée.

Besides the food supplied, the school-children brought their own ration of bread, a few brought apples (the only fresh fruit I saw), and a few brought additional pieces of meat already cooked. The major part of the food was vegetables, and the meat supplied on two days a week was a very small quantity indeed. The cheese was a small portion.

The children whom I saw at their meal were in fair condition and were less than a quarter of the total in attendance, the larger number having their food in their own homes. Those taking the school meal were doing so for a variety of reasons—the distance of their homes from the school, the absence of their parents from home because they were at work, and occasionally the poor social circumstances of the parents. One child whose ruddy cheeks and air of well-being attracted my attention had had a pneumothorax operation and had recently been discharged from a sanatorium after a long stay. Some few of the children were very pale and some ailing. They had the general appearance of children in a poor London school in the period between the wars.

Another sample chosen was the workers in an engineering works employing 900 people (100 of whom were women) in the suburbs of Paris. Because of shortage of raw materials for its work, which it could not get because of transport difficulties, the factory was only producing a part of its normal output. There was a canteen in the factory. Workers were getting the highest amounts of rations but were considerably below the physical standard of men and women such as I have seen recently in works carrying out similar operations in England.

A third sample was in a government office employing 120 staff. There was no heating of any kind in the office and no canteen. The day of my visit was one when the temperature was well below freezing-point. Some workers of the staff I saw looked ill. Of the 120, 60 were absent from work owing to minor ailments incidental to the cold weather and general conditions. These workers were less well nourished than the factory-workers I saw. All of them (as was usual in Paris everywhere) wore overcoats, hats, and mufflers while at work.

General Condition of the People

Journeys in the Paris Metro—the universal means of travel, since there are no buses, and taxis are not available—gave me much the same general impression. There are a few expensively dressed people in Paris; but few. Most women on the Metro were without hats, or with a scarf over the hair; their clothes were tidy, but men and women were very shabby even by London war-time standards.

When I went to Brussels from Paris the general condition of the people there seemed much the same. But when I left Brussels after some days, during which I spent much time in the city and saw a very large number of people in streets, tramcars, shops, offices, and private houses, I brought back with me a picture of the people very clear and definite. People in France and Belgium are in appearance, and judging by statistics, definitely below the physical standard of people in London or Manchester or Birmingham.

My return from Brussels by air took about two hours. Very soon afterwards I was in the London Underground among the usual London crowd. The impression the

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Londoner gave me was of being robustly better fed, higher-coloured, and more vigorous than the people I had been seeing in France and Belgium, and I have no doubt that the impression conveyed the truth.

France has suffered, as Belgium has suffered, very seriously from the period of occupation by the Germans. The partial paralysis of social and economic life caused by the disastrous breakdown of transport is one main reason for the continuance of this suffering. But unless very active and rapid measures are taken for relief and rehabilitation the suffering will be prolonged and its physical effects very greatly increased.

GENERAL MEDICAL COUNCIL

PENAL CASES

Sir HERBERT EASON, the president, took the chair at the session of the General Medical Council which opened on Feb. 27. Two new members joined the council: Prof. Henry Cohen as a Crown nominee, and Prof. W. J. Tulloch as representative of the University of St. Andrews, both appointed for five years.

DANGEROUS DRUGS

The case of *David Davidson Watson*, registered as c/o Graham, Colquhoun Street, Stirling, MB ST. AND. (1926). Dr. Watson had been convicted on Sept. 14, 1944, at the sheriff's court at Stirling, of procuring for himself, and for other persons by means of prescriptions, dangerous drugs, and was sentenced to a fine of £50 or three months' imprisonment. He appeared without a legal representative.

Mr. F. P. Winterbotham, the council's solicitor, said that Dr. Watson admitted two previous appearances before the council. In May, 1936, the charge was conviction of driving a car while under the influence of drink, and manslaughter, for which he had been sentenced to imprisonment; his name had been erased from the Register but later restored. Later his authority to obtain and use dangerous drugs had been withdrawn. In May, 1944, an examination of chemists' records had shown that he had ordered for himself and certain patients solutions containing cocaine to be used as eye drops or ear lotion.

Dr. Watson, giving evidence in his own defence, said that he had been working as assistant to another practitioner. Finding it necessary to prescribe these solutions, which contained very small quantities of cocaine, he had referred to the British Pharmacopœia, which had stated that the solutions came under the Pharmacy and Poisons Act but not under the Dangerous Drugs Acts. One Edinburgh and three Stirling chemists whom he had consulted had confirmed this statement. It had appeared during the prosecution that until recently these solutions had been specifically excepted from the Dangerous Drugs Acts, but in 1942 had been brought under them by a departmental regulation which had not come to his or the chemists' attention.

In answer to the President, he admitted that he had taken drugs in 1931 when suffering from severe psoriasis, but said that after his cure he had completely abandoned their use. On the present occasion he had behaved quite openly and had not made the smallest attempt at deception. He submitted a testimonial from his principal.

The PRESIDENT delivered a stern warning against the conduct disclosed by the conviction, and stated that judgment would be postponed for two years, after which time Dr. Watson would have to appear again before the council and submit evidence of good behaviour and character.

The case of *Francis Christopher Toner*, registered as of 4, Nun's Island, Galway, MB NUI (1931). Dr. Toner came before the council from prison, where he is serving a sentence of twelve months without hard labour. Mr. Winterbotham proved that he had been convicted four times before petty sessions of offences against the Dangerous Drugs Acts. The latest conviction, after which he had been imprisoned, was for unlawfully procuring tincture of opium on four occasions. He had declared in a written statement to the council that his professional work had never been affected by his addiction, and that the offences had not been committed while he had been professionally engaged. He asked the council to deal with him leniently, and produced a letter from the medical officer of Lincoln Prison saying that his health was satisfactory and he was cooperating in his treatment. The council, however, ordered his name to be erased from the Register.

MISUSE OF ALCOHOL

The case of *Alexander Lawrie*, registered as of 113, Manchester Road, Accrington, Lancs, MB EDIN. (1932). He had been convicted in August, 1944, of twice driving a motor-car while under the influence of drink. In his defence he said that he had been away from his practice for four years and the task of reconstructing it had caused him severe anxiety. Judgment was postponed for two years subject to the usual provisos of good conduct in the interval and satisfactory evidence of conduct and character at the end of the period.

The case of *Christopher Whitehead*, registered as of Greystone, Co. Wicklow, LRCPI (1926), who had been convicted in May, 1944, of driving a motor-car while incapable through drink of controlling it properly. Mr. A. A. Pereira, of counsel, who appeared on his behalf (instructed by Messrs. Donald, Darlington & Knight), pleaded for leniency on the ground of the respondent's recent domestic trouble. The President announced that judgment in this case also would be postponed for two years, but that if the respondent was convicted again in the interval, his name would be forthwith erased.

INTERNATIONAL SLUM CLEARANCE AT SEA

PAST EFFORT AND PRESENT NEED

INTERNATIONAL agreements on health and labour conditions have a happier history than most others. The League of Nations, if by nothing else, justified its existence by its international health and labour organisations. Another outstanding example has been the International Sanitary Convention (1926) for the prevention of the spread by sea of the graver infectious diseases—plague, typhus, yellow fever, smallpox, and cholera. The coming of the present war has prevented any final estimate of the merits of the corresponding agreement affecting air transport, concluded in 1938.

The Joint Maritime Commission of the International Labour Office, consisting of representatives of shipowners and seafarers, has been meeting in London, and the opening addresses of Mr. Ernest Bevin, Minister of Labour, and by Mr. P. Noel-Baker, of the Ministry of War Transport, once more emphasised the necessity for international agreements. Mr. Bevin spoke of the necessity for reaching agreement on an improved standard of accommodation for seamen on board ship. He was anxious, he said, to see the standard reviewed, not only for seamen of the Western nations but for those from the East also. He believed that where a thing could be done internationally it ought to be done that way, and he saw no reason why the principal maritime countries should not come together with a technical body and lay down the best minimum designs so that naval architects might always have those designs before them.

We trust Mr. Bevin's wise suggestions will be quickly and vigorously followed up. Nowhere will they receive greater attention than among members of the Association of Port Health Authorities of the British Isles, which since the turn of the century have laboured for the hygienic betterment of crew spaces.

THE REFORMERS

In 1902 Dr. W. Collingridge pointed out that the sanitary state of ships was 50 years behind that of the rest of the country. In 1910 Dr. Howard Jones showed that we had lost our pride of place and were no longer the pattern of sanitation at sea. In 1911 Dr. Herbert Williams, successor of Collingridge at the Port of London, wrote that the conditions under which seamen in vessels lived were particularly favourable for the dissemination of pulmonary tuberculosis, and that until the legislature took some more practical interest in the welfare of seamen, pulmonary tuberculosis would continue to be a cause of much mortality amongst this class of men. In the same year the council of the Royal Sanitary Institute,

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at the instigation of port medical officers, urged the President of the Board of Trade to require a thorough revision of the regulations respecting living quarters for officers and men of all new vessels built under their supervision.

Howard Jones in 1913, 1915, 1920, and 1924, and Dearden of Manchester in 1928, 1929, and 1930 returned to the subject in strong terms. In 1926 Fleet-Surgeon W. E. Home, deploring the lack of hygienic care of seamen, demanded that it should be taken over by the Ministry of Health. In 1922 and again in 1935 the Association of Port Health Authorities published recommendations as to the Hygiene of Crew Spaces, the most far-seeing of which was that in plans of new ships the accommodation proposed for officers and crews should be approved by a committee of which one or more member should be a medical sanitarian with special knowlege of marine hygiene.

In 1936 the port medical officer of health of Liverpool described the inspection of two ships, one foreign "in which the dominant note was one of comfort and cleanliness due to the care and imagination in planning and furnishing" and one British which "was noteworthy only by the fact that the quarters so closely resembled those provided for the crew in British ships 20 or 30 years ago." Similar condemnations of British ships visiting the ports of Hull and Cardiff at this time were also published, the Cardiff observations being included in a paper in these columns by Dr. Greenwood Wilson which summarised under the title Slum Clearance at Sea the efforts made for the betterment of living accommodation on British ships and emphasised the continuing need for such efforts as shown by the grave occupational risk to seafarers of pulmonary tuberculosis.

OFFICIAL ACTION

In 1937 the Board of Trade brought out its Instructions to Surveyors on the construction of living quarters for masters and crews in new merchant ships. Plans of new vessels henceforth had to be submitted to and approved by the Board of Trade before the shipbuilders could proceed to build them, although the Port Health Association's desire for such approval to be informed by expert medical advice is still not conceded. The principal improvements were in ventilation and lighting, and in the provision of central heating, drying rooms, heated and improved washplaces, separate messrooms, oilskin lockers, metal food lockers and wardrobes (separate for each individual), and proper water-closets. Dr. S. A. B. Black [1] concludes, from his recent survey of 60 British vessels built at various times during the past thirty years and including 21 built during the past four years, that the 1937 Instructions fall short of what is needed because they do not require medical vetting of ships' plans, the space standards are still not good enough, because their wording has a certain vagueness, and because they are not enforced rigorously enough. The seafarer has also to be persuaded to make good use of and not to abuse his improved quarters.

In so far as this could be achieved in war-time, it has been by the working of the National Maritime Board Agreement published in 1939—the fruit of the labours of a joint committee set up by the Shipping Federation, the National Union of Seamen, and the officers' societies. The effect of this agreement has been increasingly supplemented by local welfare committees set up since 1940 at all principal ports by the Seamen's Welfare Board of the Ministry of Labour, whose beneficent activities have included representation on a committee appointed jointly with the Ministry of Health and the Ministry of War Transport to consider the welfare of the mercantile marine.

Among the recommendations placed before the Joint Committee have been some interesting ones from the Association of Port Health Authorities as to improved dietaries, with better arrangements for storing, cooking, and serving food; as to pre-employment preventive inoculation and vaccination; as to an improved system of medical examination; and as to the employment on ships of sick-bay-steward-health-educationists. The same three Ministries have also had before them lately, with the strong backing of the Association of Port Health Authorities, recommendations by Sir Alexander Macgregor from the port of Glasgow to the effect that any Government scheme for a post-war medical service should include special provisions for the health and welfare of merchant seamen at the ports, with much closer linkage between the health and welfare elements.

1. *Publ. Hlth*, January, 1945, p. 40.

FURTHER OPPORTUNITY

It is in keeping with the spirit of the time to try to apply such benefits to seamen of all nations in respect both of "slum clearance at sea" and also of health and welfare services at sea and at ports. Perhaps the Association of Port Health Authorities of the British Isles will eventually have to become the International Association of Port Health Authorities. Meanwhile, in following Mr. Bevin's lead no opportunity should be lost of consultation with a body which has an admirable record of active endeavour on behalf of merchant seamen.

On Active Service

CASUALTIES

DIED

Lieut.-Colonel MARTIN PATRICK CONROY, MB NUI, IAMC
Lieutenant C. G. COX, IAMC

WOUNDED

Captain A. R. ELSOM, MRCS, RAMC
Captain T. M. ROWATT, MB EDIN., RAMC
Lieut.-Colonel R. B. WRIGHT, OBE, RAMC

AWARDS

CB

Major-General W. C. HARTGILL, OBE, MC, MRCS, late RAMC

SECOND BAR TO DSO

Brigadier H. L. GLYN HUGHES, CBE, DSO, MC, MRCS, RAMC

OBE

Lieut.-Colonel B. W. RYCROFT, FRCS, DOMS, RAMC

MBE

Captain T. B. MCMURRAY, MB LPOOL, RAMC

MENTIONED IN DESPATCHES

Surgeon Lieut.-Commander R. N. MARTIN, MB BELF., RNVR
Brigadier R. A. HEPPLE, OBE, MC, MB EDIN., late RAMC
Colonel THOMAS MENZIES, OBE, MB ABERD., RAMC
Colonel THOMAS YOUNG, MB GLASG., RAMC
Lieut.-Colonel J. P. PARKINSON, MB DURH., RAMC
Lieut.-Colonel D. L. OWEN, MB EDIN., RAMC
Major L. S. ROGERS, MBE, MB NZ, RAMC
Major O. S. WILLIAMS, MRCS, RAMC
Captain D. COLLINS, LRCPE, RAMC
Captain J. R. RICKETT, MRCS, RAMC

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED FEB. 24

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1544; whooping-cough, 1539; diphtheria, 457; paratyphoid, 6; typhoid, 6; measles (excluding rubella), 23,216; pneumonia (primary or influenzal), 1118; puerperal pyrexia, 153; cerebrospinal fever, 76; poliomyelitis, 3; polio-encephalitis, 0; encephalitis lethargica, 3; dysentery, 393; ophthalmia neonatorum, 78. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Feb. 21 was 1165. During the previous week the following cases were admitted: scarlet fever, 41; diphtheria, 19; measles, 196; whooping-cough, 20.

Deaths.—In 126 great towns there were no deaths from scarlet fever, 21 (2) from measles, 6 (0) from whooping-cough, 8 (0) from diphtheria, 52 (8) from diarrhœa and enteritis under two years, and 51 (4) from influenza. The figures in parentheses are those for London itself.

London and Greater London each reported 2 deaths from enteric fevers. There were 6 fatal cases of diarrhœa at Birmingham.

The number of stillbirths notified during the week was 192 (corresponding to a rate of 27 per thousand total births), including 17 in London.

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In England Now

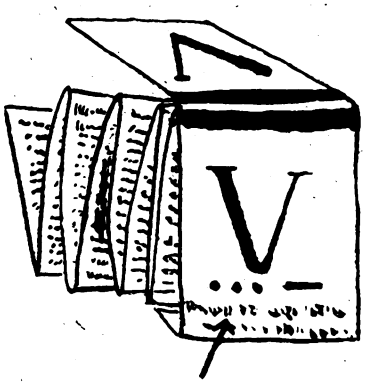
A Running Commentary by Peripatetic Correspondents

HERE is the text of a propaganda leaflet that the Germans have been dropping over our lines lately. The shells carrying them explode with a characteristic feeble plop. The leaflet is printed in minute type on a long strip and folded into a card cover as per illustration. On the ground they look like ordinary "V" book-matches. Page 1 begins with a clock-face registering 3 minutes to 12.

World War No. 2 is almost over!

Nobody can say that as a good soldier you haven't done your duty. But no man in the world will ever blame you for not wishing to be one of the last victims. The trouble about a war is that towards the end the death-rate rises to its highest. Try the safe turn during these last weeks, it is far better for you to be a few weeks ill than all your life dead. You don't know how to do it? Well, we're going to teach you the "rules of the game." But always remember the following:

Troop doctors as a rule are most suspicious in cases where soldiers are simulating. This for the simple reason that the latter are very often exaggerating the symptoms of their pretended illness and that they behave in such a manner which makes it easy to anybody to find out that they want to be ill. Moreover the doctor has the advantage in this game, because he has studied the rules, whereas the average soldier has but a faint knowledge of medicine. The object of this leaflet is to help you in overcoming this difficulty in a proper scientific way, the directions being given in plain language. The following three points are important:



Better a few weeks ill than all your life dead.

1. You must make the impression as if you hated to be ill! The doctor should feel straight away: "Here is a good soldier who has the misfortune of being ill against his will." Therefore you shouldn't exaggerate your illness. A normal sick man is always anxious to get rid of his illness, and he is very glad if the doctor is in a position to tell him that it is nothing serious. Should therefore the doctor tell you that you are still fit for duty, don't say anything, have another go at it and let the others see that "unfortunately you can't." Should the doctor try to comfort you by saying that the troubles you are complaining of are not due to any serious illness, then you should thank him for "having taken the worries off your head." You may come back a few days later with complaints about increased pains, but never come along with a new disease.

2. Make up your mind for one kind of disease and stick to it! If you start complaining of too many different troubles, the doctor will get suspicious. If you strictly follow the directions given for the various kinds of diseases, then the doctor has to mark you as ill. But be careful: if the doctor asks you about symptoms which are not mentioned on your list, don't give yourself away, simply answer: "I haven't noticed anything of the kind."

3. Don't tell the doctor too much! Above all you mustn't tell the doctor the name of the disease you pretend to be suffering from. Don't use any technical terms, doctors don't like that. You will never be found out if you say too little, but you might easily be caught if you say too much.

If you strictly follow the directions contained in the above 3 paragraphs and if you have made yourself thoroughly acquainted with the symptoms of the disease you have picked out, then nothing can go wrong.

Never forget: Better a few weeks ill than all your life dead!

MINOR TROUBLES

To be recommended to all those who need a few days' rest or who do not feel fit for a special action which they would rather miss by going to hospital. Even slighter cases of illness can save your life if you manage to get them shortly before you have to leave on a transport or before you go off on a dangerous action.

1. *Inflammation of the foot.*—Soak a ball of cotton of the size of a pea in turpentine and keep it over night between your 3rd and 4th toe. Doing this for a few days will cause an inflammation of the skin. Repeat this experiment with other toes until the inflammation starts spreading. Before reporting to the doctor you must wash your foot very thoroughly with soap, so that the smell of turpentine cannot be noticed. Turpentine may be obtained at any druggist, pharmacist or paint-dealer. In Italian it is called: Terpentina.

2. *Artificial skin inflammation.*—Scratch surface of skin with edge of a piece of glass so that red lines and scratches but no bleeding results. Apply petroleum to scarified skin area until inflammation results. To make condition more serious you may inject a small quantity of petroleum or gasoline under the skin with a thin hypodermic needle. Inject in one or more places, but take a very thin needle so that needle marks don't give you away. If doctor asks you what is responsible for the condition according to your opinion, tell him that you have no idea.

Another way of producing a harmless scarlet-like affection of the skin: Take three times daily, preferably before your meals, one teaspoonful of a 10% solution of iodine potassium in a glass of water. Carry on with this procedure until about five days later a scarlet-like affection of the skin results. This affection of the skin is often accompanied by a cold in the nose. Iodine potassium is a completely harmless medicine and is called in Italian: soluzione di joduro di potassio al 10%. The eczema will disappear within 5 to 8 days, depending on the treatment applied. A few weeks later you might start the game all over again.

3. *Dysentery.*—Take a laxative, preferably castor oil. (In Italian: olio de ricino). When it has begun to work report to your doctor with the following complaints: Tell him that you had a severe attack of dysentery some months ago in Africa, South Italy or some such place, with slime and blood in your motions. Since that time you notice that heavy foods, such as pork and beans, fat meats, &c., produce violent pains in your stomach and diarrhœa. Occasionally your motions have been slimy with red streaks and lumps in them. Tell the doctor that you nearly always suffer from mild gnawing pains in your abdomen high up, especially on the right side, but sometimes also lower down on the left side. Say that you feel weak and run down. When the doctor examines you, show painful response to pressure on the right side immediately below the ribs, also during examination of the right kidney. Stick to your story at the hospital, and don't forget to take a laxative from time to time. A few weeks after leaving hospital you might try the whole thing again.

4. *Slight affection of the stomach.*—Take daily 12 to 15 beans of ricinus. They call them in Italian "fagioli di ricino" and may be obtained at any drug store or pharmacy. Chew the beans well before swallowing. A few days later—time is not the same for everybody—you will feel slight pains in your stomach. Continue eating beans for another two days and then report to your doctor. You merely have to tell the doctor exactly what you feel. If he asks you what could be responsible for the condition, say you might have eaten too much ice-cream or something else that did not agree with you—but you had no idea. The pains, which are accompanied by a slight fever, will disappear as soon as treatment is started.

And don't forget, better a few pains than loss of all sensibility through death.

5. *A harmless inflammation of the eyes.*—If you ride a motor-cycle, if you drive an open car, or if your eyes are often exposed in any other way to a draft, then the following disease is the right thing for you: Take two beans of ricinus and grind them up with a hammer. Introduce a small quantity of the mass so obtained under your upper or lower eyelid with the aid of a match. You may also cut a bean in two, wrap it with a very thin coat of cotton and apply it with the surface obtained by cutting against the edge of your eye. Put a bandage around and leave over night. In the morning remove bandage. The resulting inflammation is altogether harmless but has the great advantage of looking externally very similar to a serious disease of the eyes.

Or try the following: Refrain from cleaning your teeth or rinsing your mouth for a few days. The white substance which then gathers on your teeth will, if introduced under the eyelids, produce the same effect as that described above.

Remember, all people have not got the same constitution, and what may be effective with some people may not produce

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any effects with others. So if the expected symptoms do not appear within the normal time, carry on with the experiment by gradually increasing the dose, or make up your mind for another disease.

TROUBLES OF A MORE SERIOUS NATURE

To be recommended to those who think they need a thorough recovery from the hardships of war in pleasant surroundings with affectionate treatment and good food.

1. *Sore throat.*—Only for those who still have got their tonsils. Take a silver nitrate stick and rub a small area of your tonsils with the tip of the stick. In Italian silver nitrate is called "pietra infernale."

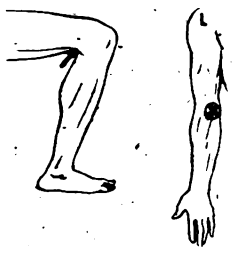
Dissolve a small quantity of yellow mustard or ginger in water: The solution is strong enough when it produces a burning sensation on the tip of your tongue. Mustard is in Italian "senape" and ginger is called "zenzero."

Twenty or 30 minutes before you report to the doctor swallow a large pinch of gunpowder. Report to the doctor with sore throat. Tell him that swallowing has been painful since yesterday and that you do not feel well. Simply describe your condition (you will actually feel sick for a short time as a result of the above treatment). Gargle occasionally with mustard or ginger solution to prolong your stay in hospital.

The above treatment is absolutely harmless. All of the resulting symptoms disappear completely in a few days.

Remember: Better a few weeks ill than all your life dead.

2. *Temporary paralysis.*—Before going to bed wrap a round stone, eraser, or short piece of rubber tubing in gauze tissue and fasten firmly to exert on spot x (x is the spot where your "funnybone" is located) with tight bandage and allow to remain over night. Take bandage off in the morning. Repeat for several days in succession until there is a numb feeling in your forearm and hand. The numbness and lack of strength, which remains for only a few minutes after the first treatments, will last for an increasing length of time in the course of further treatment. When a sufficient degree of paralysis has resulted report to doctor. Describe exactly what you feel: tell him that the condition which started suddenly is becoming worse and worse in the course of time. Continue bandaging your arm from time to time to keep up paralysis but under no circumstances let the doctor find any traces of the bandage. If there are bandage marks on your arm better not report until they are gone, which is usually the case after 24 hours at the latest.



Right leg and left arm, indicating nerves.

You can produce the same effect on the lower limb with a bandage around the knee.

3. *Nervous troubles.*—Get hold of Thyroxine tablets. Take 4 times 2 tablets daily. When your pulse is more than 100 per minute report to doctor with following complaints: You are becoming very nervous lately and feel as though you were "going to pieces." Although appetite has been fair you have lost weight. Sleep has been very poor in the last few weeks. You are very irritable and "fly off the handle" at the slightest provocation (to make this more plausible you might provoke a few arguments before going to the doctor).

If after a period of treatment you are returned to the lines you may have a relapse by repeating the above procedure.

Remember: Better a few weeks ill than all your life dead.

4. *Stomach ulcer.*—Report to the doctor with following complaints: For a number of months you have been suffering of gnawing and burning pains in the stomach region, which are especially violent 15 to 30 minutes after meals. Heavy foods, such as brown bread, beans, cabbage (be sure to mention only foods which you have eaten lately), fatty meals and greasy foods do not agree with you. Quite often you have heartburn and belching since the onset of your troubles. Your appetite is rather bad. If the doctor asks you if your stools have been black or very dark either tell him that you did observe such a condition once, but paid no attention to it, or that you are not sure. You may also say that you have never noticed anything of the kind, if you wish. The doctor will probably send you to hospital for observation.

Very important: before you report sick, get hold of a pint of animal blood (cow, ox, hog or sheep) and dry it. Don't report to doctor before you have prepared your blood powder (directions below). Take the dried blood to the hospital with you and hide it carefully. At the hospital you will receive a vegetarian diet for a few days for the purpose of testing the blood content of your stools. Take a portion of dried blood powder every evening. The blood test in your stools will be positive and the doctor will mark you as a stomach ulcer suspect. Be sure to take portion of blood powder on every day of your stay at the hospital, since the examination may be repeated.

After one or two weeks you may tell the doctor that your complaints are considerably less, if he asks you. If you are dismissed to the front you can have a "relapse" in two or three weeks.

Directions for preparing blood powder; pint of animal blood. After a few hours it looks like this: $\frac{\text{red blood}}{\text{clear serum}}$. Pour serum away and spread red blood cake out on cloth or paper to dry. When perfectly dry pulverize and divide into small portions of about a teaspoonful each and wrap up separately.

5. *Jaundice.*—Get hold of 30 to 40 digitalis tablets or pills (digitalis is a widely used heart remedy which may be procured from any druggist). In Italy a solution of digitalis 1 : 1000 can be obtained more easily, so if you don't find any tablets or pills take the solution. (In Italian: digitalis tablets = digitalina amorta (granuli di 1 mgm.); solution = sulzione di digitalina 1 : 1000.) Take daily four times 1 tablet or four times 10 drops of the solution dissolved in water. Carry on the procedure until your pulse-rate (taken at rest) has slowed down to 60 or less per minute.

Eat a lot of chocolate. Do not clean your teeth or rinse your mouth for a number of days. Take 1 gram of picric acid (let the chemist prepare it for you, it is called "acido picrico" in Italian). The skin and the white of your eyes will become yellow. The condition is harmless and disappears completely in a few days. Drink 3 raw eggs before going to bed.

Report to the doctor with the following complaints: Your appetite has been bad for a number of days and you do not feel well. Fatty foods, especially, do not agree with you. Also, your skin has been itching badly for two or three days. You have been suffering from constipation and slight pains in your abdomen. Some time before the onset of your troubles you had diarrhœa, but you didn't pay much attention to the condition, which disappeared in a few days. But don't volunteer all this information, let the doctor drag it out of you gradually by his questioning.

SERIOUS DISEASES

To be recommended to all those who are fed up of war and who would rather go back into civil life.

1. *Heart disease.*—Smoke 20 to 30 cigarettes per day. But if you normally smoke as much, then you might double that number. Get hold of digitalis tablets or pills (digitalis is a drug which is widely used as a remedy for heart disease) and take 4 tablets daily for 1 or 2 weeks. Most probably you will find more easily in Italy a solution of digitalis 1 : 1000. In that case you might as well take daily 4 times 10 drops of this solution dissolved in water instead of 4 tablets. If after a number of days nausea or vomiting occurs stop taking the drug. The condition is harmless and disappears after a few days.

Report to the doctor with the following complaints: You do not feel well and are short of breath after exertions which never caused you any trouble previously. Occasionally you have attacks of pain in the heart region, sometimes with a painful sensation in the left shoulder and arm. Sometimes there is a sharp, stinging pain near the tip of the heart, at other times only an uncomfortable feeling of oppression. Violent attacks have occurred 2 or 3 times and have lasted for about 15 minutes; there was cold sweat on your forehead during the attack and you had a feeling as though you were going to die.

The doctor will probably have an electrocardiogram done, which as a result of digitalis will show typical signs of a disease calling for rest and in most cases the removal from the strains of front life. Digitalis does not produce the disease, it merely causes symptoms which a doctor cannot distinguish from the real illness.

2. *Tuberculosis.*—If you have a smokers' catarrh (and, as a rule, you can easily acquire one by smoking 20 or more cigarettes a day), you can simulate tuberculosis which means that you will be sent back from the lines to a healthful, quiet place in pleasant surroundings with excellent food and a long vacation.

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Tell the doctor that you have lost some weight lately and that you do not feel well. You cough a great deal, especially in the morning. Recently, you have coughed up tiny clots and streaks of blood in your sputum. Sometimes you wake up in the middle of the night drenched in sweat. You continually feel tired and run down. Stick to these symptoms and don't invent any new ones!

When you are asked to produce some sputum you must mix a very little blood (one or two drops are sufficient) with the sputum. If your gums bleed, you can do that by simply sucking out a bit of blood before producing the sputum, otherwise you must suck the blood from a little wound on one of your fingers.

To make your case convincing you must mix some tuberculosis germs into the sputum. This, of course, is difficult, but every man carries an excellent substitute with him. If you have failed to wash the prepuce (foreskin) of your penis for two or three days a yellow substance called smegma is deposited underneath the foreskin. This substance contains a group of harmless bacteria possessing a very remarkable feature: in appearance and staining qualities (criteria used in routine medical examination to establish the presence of a certain bacterium) they behave exactly like tuberculosis germs. Very few doctors know this, and even if they do they will not have the time or necessary apparatus to make the distinction. Of this smegma you must mix a very small quantity (as much as you can hold underneath your fingernail) with the sputum in your mouth. Produce the mixture of sputum, blood and smegma into the glass or plate which you are given and stick to your story as indicated above.

The doctor will surely have an X ray made of you. If he finds that it is normal he can only conclude that the tubercular process is situated in some hidden corner which the X ray did not reveal. If you follow the above directions carefully and conscientiously, there is no danger of your being found out.

Remember: Better a few weeks ill than all your life dead.

AN ADVICE: Some of the drugs mentioned in the above directions can only be obtained against a doctor's prescription. If you can't get hold of a prescription, then consider the following:

1. *The Italians are cowards*: Rush into a pharmacy and say you must have the medicine at once for your troop doctor who is in urgent need of it. Be determined and resolute in your demand. If you see the chemist is hesitating, take out your pistol and put it on the table without saying a word. You will find that in most instances this proves very effective.

2. *The Italians are corruptible*: If you think you can't be determined and resolute enough, try it with money. In Italy anything may be obtained for money.

IMPORTANT!

All the above directions are based on scientific observations and experiments in well-known university hospitals. They do not produce any illness, but mere symptoms which cannot be distinguished from real diseases, even by trained troop doctors.

They are absolutely harmless! We wouldn't be so silly to make you lose confidence in our directions by giving you dangerous prescriptions.

Never forget: Better a few weeks ill than all your life dead.

The authors would be disappointed if they could see how lightly their elaborate propaganda is received by our soldiers. They say they know far better tricks than these! Most of the suggestions are impracticable here. It is curious that the psychiatric side is so lightly dismissed.

Is it a coincidence, do you think, that the recurring refrain about "Better a few weeks ill . . ." is a near quotation from the Irish song, *Slattery's Mounted Fut*, which says: "Better be a coward five minutes than a dead man all your life"?

* * *

I have a reputation for trying new drugs as they appear. The morning sister was off duty: the confident young staff-nurse (married to an officer recently wounded in Holland) tackled me about the pills I had ordered for the patient who was proving obstinately costive. She was frankly puzzled. "What is this new aperient you've ordered?" she asked. "I wrote it down and asked some of my friends but none of them had heard of it. Sister didn't know what it was." Shades of the last war! I'd ordered a couple of No. 9's.

Parliament

CONTRIBUTORY NEGLIGENCE BILL

IN the House of Commons on Feb. 22 Sir D. MAXWELL FYFE, Solicitor-General, moved the second reading of the Law Reform (Contributory Negligence) Bill, which has already passed through the House of Lords. He explained that whereas on land a person who had contributed to causing an accident by his negligence failed utterly, at sea a ship in the same position got the proper proportion of the damage. Generally the intention of the present Bill was to apply the Admiralty rule to accidents on land, and thus give the injured plaintiff the right to a proportion of the damages that he or she would have recovered had he or she been entirely free from blame. The Bill would not apply to actions brought by a workman against his employer for accidents occurring in the course of and arising out of his employment, but this was a temporary provision pending the further consideration of alternative remedies.

In the debate Dr. RUSSELL THOMAS suggested that the Bill might tend to increase the number of actions taken wilfully against professional men on the off-chance of getting a quantum of damages. He had investigated a long list of such actions taken over the last 30 or 40 years against doctors, and he found that in few cases did the plaintiff succeed, and the court often condemned the plaintiff for bringing the action. Many of the actions were due to distress of mind, but sometimes to spite or malice or sense of grievance. Cases against doctors often fell into the category of actions resulting from confinements, pecuniary loss due to compulsory notification of infectious disease, and the treatment of fractures. It would be easy, perhaps, now to come to court and endeavour to show some degree of negligence.

Sir D. MAXWELL FYFE said he had had experience in the class of actions referred to by Dr. Russell Thomas; but the question of contributory negligence arose seldom, and the issue in these cases was whether there had been negligence or some breach of duty on the part of the professional man. That took a great deal of establishing, and there were few successful cases. In that class of case he could not see that the professional defendant would be prejudiced in any way.

FROM THE PRESS GALLERY

The National Loaf

IN the House of Lords on Feb. 28 Lord TEVIOT asked whether the extraction rate of wheat used in the national flour had been reduced below the 85% standard of 1942, and moved that this should be regarded as the minimum compatible with health, and that if the extraction rate had been reduced it should be restored to the 1942 figure forthwith. He recalled that before the war the extraction rate was 70–72%; in March, 1942, it stood at 75%, and was then raised to 85%; it was now 80% or lower.

I want to know definitely, Lord Teviot continued, why this reduction has taken place and on whose advice it has been made. For instance, has the Ministry of Health, the Special Diets Committee of the Medical Research Council, or the scientific advisory committee on food policy, set up by the Ministry of Health in 1940, been consulted? I am informed that this last committee has not met for two years. It has been found that wholemeal or high-extraction flours are of higher nutritive value when tested on experimental animals than 70% extraction flour, even when this is fortified to the greatest possible extent by the addition of food factors removed in the milling of white flour. There are eleven factors in this matter and it has only been found possible to manufacture enough of three of them to fortify the white loaf. That leaves eight factors of great importance. In my view and the view of those with whom I have discussed this matter it is ridiculous to claim that the addition of the three factors to white flour will make it as nutritious as 85% extraction flour. It is highly improbable that we shall ever be able to manufacture the factors removed by milling white flour in quantities and in forms identical with those in the natural wheat. Therefore, why remove them? Tests carried out by the Medical Research Council showed that

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the maximum nutritive value of wheat with the minimum of bran was secured by milling 85% extraction. Why then was this extraction rate lowered? The medical profession and nutrition experts throughout the country are unanimous in deploring the change. We hear that people prefer white bread, but I wonder whether that statement has been really tested. I have often asked people what bread they eat and the answer invariably is, "I try to get brown bread but it is so seldom procurable." The Minister of Health said on Jan. 27 that the national flour content of the national loaf was approximately 75%. What is in the other 25%? The people of our country should know what they are eating.

Lord ADDISON asked what were the commercial considerations involved. As Minister of Agriculture he had gathered from conferences with those in the industry that if you took a bigger proportion of "offals" out of the wheat what remained had a greater proportion of starch, and you might be able to sell the "offals"—they were not offals in the colloquial sense—very profitably. It therefore pays, he said, to increase the percentage of offals taken out. Moreover, he went on, white bread contains more starch than wholemeal bread, and this is profitable because a starchy bread will absorb more water. In former days 92–96 quartern loaves could be produced per standard sack of flour, but with modern milling methods, operating on a very white flour, the number could be raised to 102, which meant an additional 32 lb. What of? Water.

LORD HORDER'S VIEWS

Lord HORDER recalled that the main consideration in raising the extraction rate of flour during the war was not primarily the health of the nation but the urgent demand for shipping space. In this way 500,000–600,000 tons of shipping space were saved per annum. Lord Woolton did also appreciate that he was on the side of the angels in the matter of national health. There was a good deal of opposition to the 85% extraction in the early days, but it is now a good many months since any complaint has come to the Ministry, though there are a few individuals who say the national wheatmeal bread does not agree with them. But experience had borne out Lord Horder's forecast that no single step the Government could have taken in regard to the nation's food was so calculated as this to raise the country's nutrition. As an example, it has made the country much less constipated. People have broken their bad habit of eating white bread; are we going now to ask them to unlearn their lesson? The Prime Minister warned us that we are now more hard-pressed for shipping than ever before; our milk-supply is lamentably deficient; and about a quarter of our entire crop of potatoes has been lost by frost, &c. The inhabitants of several of the liberated, or about to be liberated, countries are starving, and the rise in the extraction rate from 75% to 85% supplied enough extra bread to give 1¼ million people a pound a day. In view of all these circumstances is it to be wondered at that people ask the reason for the Government's decision. They are not impressed by being told that as the war is, we hope, nearly over, people will say: "This is a free country; let us have the bread we like." Are we going to compel the citizen who has learnt the value of a nutritious loaf, which he now prefers, to return to the pre-war bread from which he has been weaned, if this is a free country? And as for clamour, there is no crowd in Downing Street shouting, "We will have white bread;" there is not even a Press campaign. It was assumed, rather prematurely, that if we had no offals for the cows we should have a shortage of milk, but there is no evidence that milling offals are good milk producers, and we have it on the authority of Professor Kay, of the National Institute for Research in Dairying, that the vitamins of wheat offals are wasted on the cows. Indeed, Professor Kay alleged that the cow would not give a whisk of her tail if she never saw wheat offals again. As for pigs and chickens, the addition of wheat offals to their food does help them considerably to thrive. The people who are so anxious to give the germ of the wheat which we want in our bread to pigs and chickens should give the pigs and the chickens the vitamins that they want to put back into our bread; man should be reserved to the end if we want to experiment. The one consideration which might justify, at some future time but not yet, a reduction in the extraction rate is the knowledge which recent researches have given us of the intimate composition of the wheat berry. For these researches great credit is to be given to Dr. Moran and his colleagues at the Cereals Research Station at St. Albans. The Government have "cashed-in" already on these researches, and done so somewhat hastily many people think. It has been officially stated that as a result of the first lowering of the extraction rate by 2½% last October, the sacrifice of essential nutrients of the vitamin class was inappreciable, but we do not know yet what we have lost by the second 2½% reduction on Jan. 1 You cannot go on using the word "inappreciable" with every 2½% reduction indefinitely, because you are bound to come to a point where some thinking person will ask you "How many 'inappreciables' go to an 'appreciable'?"

I strongly favour our sticking to the natural food, said Lord Horder, especially when that food is our staple article of diet, as against adopting a food which has been modified rather on the lines of an economical equation. The Red Army is fed on 100% extraction—it takes no risks in this matter—and judging by its performance it is justified. At best we can replace only the nutrients that we know and can estimate; we cannot replace those which, though known to nature when she makes the wheat berry, are unknown to the chemist. When Hopkins made his pioneer discoveries in the field of vitamins forty years ago he spoke of "countless substances" which would eventually be found to come into this category. We are still in the early days of this science of nutrition. Every year we add to our knowledge and surely the moral is not to tinker with so important an article of food as bread until our knowledge is much more advanced than it is today. It is between these very figures of 85 and 75% that any lowering of the extraction rate loses to us the wheat germ which contains the constituents that we require most. An 80% extraction rate may be justified in the light of our increased knowledge as applied to milling technique, but I do plead with the Government not to make the extraction rate lower than this. The Government should effect a specification of the loaf as a long-term post-war policy. The specification obviously will be changed from time to time, but let us have a post-war specification based upon all the knowledge available.

Lord GEDDES said that a high rate of extraction has an important bearing upon the tooth health of the people as well as upon general physical health. There is no knowledge anywhere in the world today which would enable us to take pure starch and put in all the things that are required to make that pure starch a complete and adequate diet. That is a part of what is being tried to be done when you add to a flour something that you think you have extracted. You cannot know whether you are putting back the whole thing that has come out. It pays a miller to have people eating brown bread on a basis of profit per loaf. But it pays the miller better over the whole of his business to have people eating white bread, because they have to eat so much more white bread to get the feeling of nutrition that they get from eating brown bread. I can see why the millers would be satisfied with a low extraction, but I am certain they would never oppose a higher extraction.

Viscount BLEDISLOE, who at one time had the third largest herd of pigs in the country, admitted that milling offals, particularly sharps and middlings and bran, are invaluable to the pig producer, especially so far as young pigs are concerned, because there are factors in these offals which build up the framework of the young animal and for which there is no adequate substitute. But surely children must be given a priority over pigs.

GOVERNMENT EXPLANATION

Lord WOOLTON explained that before the Government decided to reduce the rate of extraction they consulted the Minister of Health and his chief medical adviser, the scientific adviser of the Ministry of Food, and the secretary of the Medical Research Council. The Scientific Advisory Committee have never been consulted on a matter of this character, nor was the Special Diets Committee of the Medical Research Council brought into

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consultation, for its job is to advise the Minister of Food on the food requirements of persons suffering from specific diseases. The millers were not consulted. He would not say what advice was given by the various persons consulted. Where, he asked, are we going to arrive if Ministers who are responsible to Parliament are to say what was the opinion of this or that adviser? This decision was made on his own advice, before he left the Ministry of Food. His decision followed a visit to the Ministry of Food research station at St. Albans, where Sir Jack Drummond and Dr. Moran told him of their work which showed that the bulk of the vitamins and minerals in the wheat grain are located in the germ, particularly the scutellum fraction, and in the outer endosperm adjoining the bran. It was found possible to separate the scutellum and bring it into the flour, and in this way to make an 82% extraction flour which contained as much vitamin B as the previous 85% extraction [1] while containing less bran. Of the other vitamins some were increased and some decreased. Since then, Lord Woolton continued, it has been suggested that we can go lower and still get all the advantages from a health point of view with less bran. We are trying that experiment out. We do not intend to reduce the rate below 80% until we are satisfied that it will not be detrimental from a nutritional point of view.

Lord BALFOUR OF BURLEIGH enquired on what authority the further reduction in rate of extraction to 80% was made. The results of the analysis of that extraction have not yet been published, and are not yet satisfactorily established. Many of us fear that in the reduction from 82½% to 80% the flour has lost, among other things, an undue proportion of iron. There is evidence of a general reduction in anæmia during the war, and it seems probable that the national bread, which has increased the intake of iron, is responsible. One of the greatest authorities on nutrition in the country guesses that the 80% extracted flour contains 40% less iron than the 85% flour; he expects an increase in anæmia as a result of the reduction, and if the rate of extraction is further reduced to 70–72% he expects a great increase. Do let us make sure what the result of 80% extraction is before we put it down or up.

Pressed for a firm undertaking that the extraction rate would not be reduced below 80%, Lord WOOLTON said he could not be absolutely precise, because a varying proportion of imported flour of lower extraction is now mixed with the national flour. With this proviso he repeated this assurance:

> "We do not intend to reduce the extraction rate below 80% until we are satisfied that it will not be detrimental from the nutritional point of view."

Mr. E. J. SMITH

Mr. E. J. Smith, custodian of the Buckston Browne Farm of the Royal College of Surgeons at Downe, has died at the age of 55. He entered the service of the College as messenger in 1908, being promoted museum attendant in 1913. He thus had as colleague the celebrated prosector, William Pearson, whose tradition of skill and devoted service he absorbed and maintained. He served in France with the County of London Regiment during the 1914–18 war, and on his return was placed in charge of room 1 of the museum, where the anatomical and osteological collections and the unique series of ancient and modern human crania were his special care. A patient, industrious, and careful worker, he became a master of skull-craft and an accomplished osteological draughtsman. He was unsurpassed, and probably unequalled, in the technique of restoring fragmentary crania, and it was he who chiselled out of their rock matrix the fragile fossil bones of the Mount Carmel child. Geologists and archæologists brought to the museum for identification fossil or ancient bones and Smith traced these (often minute) fragments with an acumen born of familiarity with the College collections. When the Buckston Browne Farm was opened in 1932 Smith was appointed custodian, and Mrs. Smith housekeeper. Although born and bred a Londoner, he took kindly to village life. His modesty and quiet intelligence earned the respect of all, and he continued to serve the College with characteristic fidelity and conscientiousness.

1. See *Nature, Lond.* 1944, **154**, 788.

Letters to the Editor

OUR TUBERCULOSIS SERVICE

SIR,—I was extremely interested in your leading article last week and would like to say how wholeheartedly I agree with your statements about the unevenness of the standards of treatment, the need for amalgamation of the smaller local-government authorities, and the absence of any adequate scheme for the rehabilitation of patients once they have left a sanatorium. I should, however, like to bring to your notice one or two suggestions which would in my opinion be an improvement on the present system.

Open pulmonary tuberculosis must, it is generally recognised, be isolated; but it is only one of the diseases which affect the lungs, albeit a most important one, and at the level of primary diagnosis at all events it would I think be better if this work was carried out by a team of doctors who have special knowledge of diseases of the chest of all types rather than by those specialising in only one branch of the subject.

Primary diagnosis should be nowhere better done than at a special outpatient clinic of a general hospital. (Whether the hospital is voluntary or municipal is of secondary importance provided that it is efficient and centrally placed.) The patients could there be divided into three classes. Those who were proved cases of pulmonary tuberculosis should be segregated and treated in a sanatorium, which could be a geographical part of a general hospital or could be a separate unit many miles away, depending on local conditions. Those of doubtful diagnosis should undoubtedly remain at the general hospital under close observation until the doubt was resolved; and those suffering from non-tuberculosis conditions should be treated in accordance with their needs either in the general hospital or at home. At the Brompton Hospital for Diseases of the Chest this type of organisation has been working with eminent success for many years; and one visualises such a department at each of the key hospitals throughout the country. Further one would hope to see the closest coöperation between the chest departments and the already existing local-authority sanatoria.

In charge of the department there would be a physician with an adequate staff of assistants; in order to attain the proper unity in the whole thoracic service this physician should act in a consulting capacity to the attached sanatoria, and it should be possible to call him in to help in any difficult chest problems wherever they occurred in the areas served by the hospitals. He would have to be a man primarily of outstanding clinical ability.

The surgical side of such an organisation has already been partly determined. Since the outbreak of the present war thoracic units have been established up and down the country, associated with university medical centres under the Emergency Medical Service. These units have come to stay. They have done excellent work not only in treating chest cases but also in opening the eyes of the medical profession to the advances which surgery has made in the treatment of chest injuries and diseases. In a future thoracic service these units should work with the chest departments previously outlined. It will probably be unnecessary to have a thoracic surgeon attached to each; but with a very little arrangement it should be possible for a visiting surgical team to deal with the cases in each centre, with a resident surgical officer of registrar status to watch the day-to-day progress of the cases in the absence of the senior surgeon. The thoracic surgeon should be responsible for all major chest surgery in his region.

Tuberculosis outpatient clinics, including artificial pneumothorax therapy, should ideally be held in the general hospital where they would have the assistance of radiological, pathological and other departments of the hospital when needed. They would be run by the tuberculosis officer but should nevertheless be the responsibility of the physician in charge of the chest department.

Attached to the chest-department outpatient clinic of the future one can foresee a mass-radiography plant with its team of specialists; and by this means it is reasonable to hope that many chest diseases will be

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detected at a time when there is a good chance of cure, avoiding the present too-frequent disappointments of advanced phthisis and inoperable carcinoma when the patient is first seen.

Exeter. C. J. FULLER.

PNEUMOCOCCAL LOBAR PNEUMONIA

SIR,—May I reply briefly to the comments by Dr. Ramsay and Dr. Luxton (Feb. 24) on my paper of Feb. 3 and my letter of the following week?

The benefits of chemotherapy in lobar pneumonia have been very difficult to assess, but the analysis of 1949 cases by Anderson[1] and his colleagues in Glasgow confirmed that outstanding factors influencing the mortality-rate were the age of the patient, the presence of bacteræmia, the type of the infecting pneumococcus, and the duration of illness at the time of admission. Bearing this in mind Dr. Ramsay and Dr. Luxton would surely agree that the 17 cases with very low blood-levels which I described contained some really ill patients. Although several patients were critically ill and I was aware of the low blood-level, more intensive chemotherapy was withheld; yet all recovered. It is highly improbable that all these 17 cases would have recovered without chemotherapy.

There may be effective ranges of the blood-concentration of the sulphonamide drugs; but the evidence is not conclusive, and it is my firm belief that there is no need to exceed the recognised dosage of sulphonamide. Unlike Dr. Ramsay, I feel that, for patients who are critically ill or who do not respond satisfactorily, more intensive chemotherapy is not the most important means of reducing the fatality-rate in pneumonia.

We cannot influence the incidence of pneumonia in the aged, but we can begin chemotherapy earlier in the illness. Dr. Ramsay in his paper of Jan. 20 does not mention this as a means of reducing the fatality-rate. Hospital cases represent a small proportion of all cases of pneumonia. General practitioners are unable to determine the blood-level of the sulphonamide; but with early diagnosis sulphonamide treatment can be started, either at home or preferably in hospital, at a very early stage of the illness.

ARCHIBALD DICK.

TRAUMATIC ANURIA

SIR,—Apart from the question whether in anuria the first or second convoluted tubules of the kidney are the more affected, there is a deeper issue. In the case of the miner crushed by falling rock, reported in your issue of Feb. 3, one reads that in spite of the oliguria and anuria large quantities of fluid by mouth and intravenously were given. From the time of admission nine pints were administered on the first day; with an output of 8 oz. of black and smoky urine. The next day, eleven pints were given; but there was no urine at all. On the 3rd day eleven pints produced only 5 oz. of black and smoky urine. Three pints, all by mouth, on the 4th day gave ½ oz. of clear urine; and five pints the next day gave 7 oz. of clear urine. But on the 6th day five pints by mouth gave no urine; and the patient died on the day after. Post mortem, "the kidneys were enlarged and swollen and the capsule thin and tense." The medulla of the kidney was "engorged, with very clear differentiation between cortex and medulla."

This postmortem finding is not unique: it is common to all cases of anuria, whether occurring in cases of intestinal obstruction, in cases of urinary difficulty from enlarged prostate, after the strains of labour (especially in women with the so-called toxæmia of pregnancy), and doubtless in many other cases—even in soldiers wounded by high-explosive missiles. (See cases of "traumatic uræmia" reported by Darmady and others in THE LANCET of Dec. 23 last.) It is not only common to these cases: it is a conspicuous feature in patients dying of acute Bright's disease. In view of the facts (1) that anuria must result if urine cannot get out of the cortex, and (2) that congestion of a part inhibits the flow of fluids through the part, should not this congestion, this engorgement of the medulla (or of certain parts of the medulla), receive consideration? But in your leader of Feb. 24 this state of the medulla is not referred to: clinicians at the bedside give it no regard: pathologists pass it over without comment. It is clear that to understand anuria, the cause or causes of congestion of the renal medulla must be elucidated.

In a letter one cannot go deeply into this question: but I may perhaps say that the condition must be due either to factors preceding admission or/and to what happens after. Exposure (the effect of cold), the psychic reaction (the effect of fear), the pain and its possible reaction—these do not occur without causing changes in the circulation. Vomiting seems an especial cause in certain cases (see reports of Darmady et al.). Treatment, however, is of some effect. This last week, in a film called *Accident Service* shown at the Royal Society of Medicine, I saw on the screen a patient, stated to be suffering from shock, treated in the horizontal posture. The first thing to do in shock, in my view, is to place the patient in the Trendelenburg position: that, in itself will keep him alive. The pressing of fluids seems to me bad. In acute Bright's disease clinicians have learnt to limit fluids. Possibly the time may come when, faced with anuria, clinicians will dictate an even more stringent treatment. One pint of fluid a day, rather than the pressing of fluids; venesection rather than transfusion; heat to the body generally rather than ice-packs to the affected limb or limbs or parts; the Trendelenburg position rather than the horizontal and the lateral; the semiprone (Sims's position) rather than the dorsal—all these come up for consideration.

What one wants to do is to prevent the condition or to save the patient when it has developed. Whether the first or second convoluted tubules are the more affected can be neglected: however it be, resolution of this question helps neither in prophylaxis nor in treatment.

Rugby. R. H. PARAMORE.

POLIOMYELITIS

SIR,—In your interesting annotation on "What determines poliomyelitis epidemics?" (Feb. 17) you make the following suggestions and remarks:

> "May not the minor illnesses associated with poliomyelitis epidemics be, after all, not abortive cases of the disease, but rather instances of an associated infection which, in the unlucky, opens the way to an attack by the virus? . . . We are accustomed to the idea that virus infections pave the way for secondary bacterial invaders. The notion that bacteria may pave the way for viruses is not new . . . and we may yet learn that there is a rheumatic-fever virus activated by streptococci."

I merely write to point out that this last suggestion has recently been put forward with a certain amount of supporting evidence (*Ann. rheum. Dis.* Sept. 1944) that this may in fact be found to be the basic rôle of the streptococcal infections in the ætiology of rheumatic fever.

BLA W. S. C. COPEMAN.

TREATMENT OF BURNS

SIR,—Your annotation of Feb. 3 quotes a statement by Mr. Thomas Gibson and Dr. Alexander Brown of the Glasgow burns unit, that adults with burns of more than 15% of the body surface, and children with burns of more than 5–10%, need transfusion of plasma, &c. The area of *one* side of the casualty's hand may approximately be considered as 1% of his total surface area. Surely a casualty with a burn of considerably less than 15 of his hand areas in the case of an adult, and 5–10 of his hand areas in the case of a child, might well require it? In an article by M. C. Oldfield (*Leeds med. Mag.* February, 1941), a "minor" burn is defined as one in which, among other factors, not more than one-tenth (i.e., ten hand areas) of the body surface is involved. This appears excessive. I should be inclined to consider any burn involving more than 1% (i.e., the area approximately of the casualty's own hand) as approaching the "major" category, especially of course if involving face, trunk, hands, or flexures, and if of second-degree or worse intensity. I should add that Oldfield later classifies "nearly all burns in babies and small children" as major.

Guildford, Surrey. J. L. BARFORD.

1. Anderson, T., Aitchison, J. D., Alstad, K. S., Barclay, R. S., Dick, A., McKenzie, D., Markson, J. L. Pneumococcal Pneumonia and its Treatment in Glasgow, 1938–42. Published by the authority of the Committee on Health, Glasgow.

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RESTAURANT HYGIENE

SIR,—Mr. Linfoot's letter in your issue of Feb. 24 describes some interesting bacteriological findings, and everyone will agree on the importance of cleanliness in restaurants. But the inference which he attempts to draw from his findings can hardly be correct. There is little reliable evidence that disease is spread by drinking from cracked cups, although there is a considerable amount of evidence that carelessness in the preparation of food, particularly neglect in washing hands, can cause outbreaks of infectious disease. It is probable, too, that any pathogenic organism found in the crack of a cup would be present in too small numbers to infect a person drinking from the cup.

Mr. Linfoot's argument is an example of the wrong use of bacteriological investigations, which should be used to confirm clinical findings or suspicions and not as a means of propounding a definite theory of a disease. We live in a world teeming with bacteria of all sorts, and the mere isolation of a micro-organism from any particular place does not necessarily mean that it is a source of disease.

London, SW. AMULREE.

ARTIFICIAL RESPIRATION

SIR,—Whether the method of artificial respiration by rib traction, as described by Dr. Viswanathan on Feb. 24, is as time-honoured as those of Schafer and Silvester, I know not; but it is certainly not new. In 1907, whilst I was a postgraduate student in the University Women's Hospital in Berlin, the method, to me then a novelty, seemed to be in common use. That is where I learnt it, and on the few occasions on which I have had to do artificial respiration for respiratory failure in cases of general anæsthesia or eclampsia, I have used none other and have taught it to house-surgeons and students. It is simple and easy, but one must work gently, though firmly. As for its efficacy and superiority over Silvester's, I am in complete agreement with Dr. Viswanathan, who has done a good service in proclaiming it so excellently.

London, W1. EARDLEY HOLLAND.

CONTROL OF LIVER EXTRACTS

SIR,—Your leader last week refers to "the more highly purified types of liver extract, such as those composed largely of the Dakin and West fraction." We have prepared (*Brit. med. J.*, 1945, i, 75) a fraction at least ten times as pure as Dakin and West's fraction (*J. biol. Chem.*, 1935, **109**, 489), as judged by comparison of the hæmatological data recorded. The method of preparation bears no resemblance to the method described by these authors.

We are aware that our fraction is not a pure substance, and write to correct a common impression that the Dakin and West fraction is the pure anti-anæmic factor.

Glaxo Laboratories, Ltd., Greenford, Middlesex. W. B. EMERY. W. J. HURRAN.

CASUALTIES.—Mr. W. MCADAM ECCLES writes: Since damage and casualties are still occurring in southern and sometimes in northern England, though the day of their cessation is drawing near, it is not inappropriate to remind medical officers and others associated with Civil Defence and ARP, that the unique coloured film of *Casualties* is still available for exhibition after having been shown to many thousands of workers. All particulars can be obtained from the manager, Mr. J. Magrill, 17, St. Quintin Avenue, London, W10.

CAMPAIGN AGAINST VENEREAL DISEASES.—The Ministry of Health, in collaboration with the Ministry of Information and the Central Council for Health Education, is maintaining during 1945 the national campaign, launched in 1942, to instruct the public about venereal diseases. Press advertisements, broadcast talks, and films will again be used, and a special display of posters in all parts of England and Wales has been arranged. Local authorities have been asked to coöperate with the Government by making the fullest possible use of the new publicity material offered to them. There is evidence, the Ministry says, that the campaign as a whole continues to have the approval of the vast majority of the public.

Obituary

FRED HOUDLETTE ALBEE

M D HARVARD, F A C S

THE death of F. H. Albee of New York, in his 69th year, removes from the contemporary scene one of the outstanding international figures in surgery. An account of his career and achievements reads like the classical American success story, for Albee "came up the hard way." From a Maine farm, through a country college (Bowdoin), and the Harvard Medical School, he reached the pinnacle of surgical fame, material success in New York, and a large estate in Florida. Throughout the journey, which included a period in general practice in a small town, he showed an intensity of purpose and a driving power paralleled by few men in the history of surgery. His determination to get on, and his early meteoric success, aroused admiration and a following; but also, as time went on, not a little criticism and opposition.

Albee has left his name indelibly imprinted on the technique of bone-grafting in surgery; for he transformed what, even in the hands of such masters as Ollier and Macewen, had been a biological exercise, into an art founded on exact craftsmanship. Looking back to the austere days of his boyhood with the nostalgia of the successful man, he would often recall the debt he owed to his maternal grandfather, a man of Huguenot descent who had been a ship's carpenter, later a house carpenter, and who was in great demand as a tree-grafter in the countryside. The operation of inlay bone-grafting applied by Albee, first in cases of Pott's disease and later in the treatment of delayed union and non-union of fractures, opened a new chapter in reconstructive surgery. In 1913, during the International Congress of Medicine in London, he demonstrated his spinal fusion operation and the motor-driven saw he had designed. In the last war, after a short period of service with an American hospital in France, he organised a large orthopædic centre at Colonia in New Jersey. This gave him full opportunities for the exhibition of his superb craftsmanship in reconstructive surgery, and more especially in the bone-grafting of ununited gunshot fractures. After the war, despite the calls of an ever-growing practice which reached enormous dimensions, he devoted much time and energy to the establishment of curative workshops in New York, and became the chairman of the rehabilitation commission set up by the State of New Jersey to provide for the needs of the disabled of industry. It is sometimes forgotten that in the field of social orthopædics also Albee was a pioneer. He had an instinctive and sentimental interest in the welfare of the cripple. This was part of his social philosophy—the moral materialism which Hamilton Basso has recently described as a characteristic American attitude towards life.

During the years between the two world wars, Albee travelled far and wide in Europe and South America. He was a regular visitor at national and international surgical congresses, where he spoke to large audiences. He would open a discussion, or read his paper illustrated by a cinema film, in characteristic dogmatic and colloquial style. There was no question of argument; he had told them. And as he had no knowledge of foreign languages he could sit back and relax during subsequent discussions. With the late Vittorio Putti of Bologna he was one of the founders of the International Society of Orthopædic Surgery, launched in Paris in 1930. At the time of his death he was vice-president of this body, and he did not conceal his hope of becoming president in the fulness of time. Another of his efforts in international organisation was the foundation of the Pan-American Medical Congress. In the course of his journeys Albee acquired decorations from sixteen different countries, and at the banquets of national and international congresses he appeared with more miniature ribbons than any South American general. Although he submitted good-humouredly to the chaffing of his British colleagues, he showed a schoolboy delight in such tokens of recognition of his fame. He was always in the limelight; he could not efface himself; and the publicity accorded to his activities in the lay press on several occasions unfortunately undermined his status and ethical leadership in the profession of medicine in his

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own country. His British friends, who perceived the simple kindly man under the hard-boiled exterior, could naturally take a more tolerant view of such affairs. In retrospect these are small blemishes in the career of a man of outstanding attainments.

Albee has earned a permanent place in the valhalla reserved for the master craftsmen of surgery. Colleagues the world over, and thousands of patients who benefited from his unerring skill, will regret his passing. Like his countryman, J. B. Murphy, he was an individualist and created no personal school, but his influence on the art of surgery will long endure.

CHARLES MACDONELL ANDERSON
MD EDIN.

Dr. Anderson, who died on Feb. 17 at the age of 78, was the son of a colonel in the Sappers who had been through the siege of the Residency at Lucknow, and the nephew of Sir James Outram, also of Mutiny fame. He graduated at Edinburgh in 1889 and then went to the London Hospital and took the Conjoint diploma in 1892. Like many others of his time he went abroad for post-graduate study, to Vienna and Dresden, after which he was assistant in the ear, nose, and throat wards of the Edinburgh Royal Infirmary. Coming South he settled and practised for nine years in Faversham before going to South Kensington where he rapidly acquired a fashionable practice and spent the rest of his life. During the last war he was in charge of the Lady Mary Meynell Hospital for officers and the Red Cross Hospital, Grosvenor Gardens, and he was twice mentioned in dispatches. In this war, though failing in health, he worked all through the blitz days. He was a good physician of sound judgment and even temper, never ruffled or put out, and he had a large circle of friends.

THE LATE PROFESSOR RITCHIE

"As the years pass," writes one of his former assistants, "I am increasingly grateful for my good fortune in starting my professional career under the guidance of W. T. Ritchie. He demanded a standard of work that at times might seem unduly high, but it was no more than he demanded of himself. Often the Saturday round would end at 2 PM, and when one finally saw the chief off in his car it was with a realisation that only a concentrated weekend's exertion could cope with the mass of work to be done by Monday morning. But it was a training that none of us would have missed. His Sunday morning rounds, attended by his clinical tutor, house-physician, and juniors, were the outstanding event of the week and were a lesson in clinical acumen and intuition. He could suffer fools, though perhaps not gladly; but knaves never. Any suggestion of dishonesty would rouse him to outbursts of indignation and anger that were as passionate as they were brief; but any honest attempt at a job was given its meed of appreciation. Incompetence was equally detestable to him. Once a house-physician explained that a patient's blood-pressure was not recorded because the baumanometer was broken and the surgery could not supply a spare one. Within two minutes Ritchie was on the telephone to the superintendent, and within ten minutes a messenger arrived post-haste from the nearest instrument-maker with a brand-new machine.

"Quality, not quantity, was Ritchie's aim, and he never published a paper unless he was convinced that it was a contribution to knowledge. It was one of his boasts that no firm of manufacturing chemists had ever been able to quote any paper of his in advertising their products. He belonged to a generation of outstanding cardiologists and his contribution to his specialty has never received full recognition on account of his persistent refusal to rush into print. The history of auricular fibrillation, for instance, might have been very different had it not been for this self-imposed denying ordinance. But it was not only as a cardiologist that he excelled. He was a first-class general clinician, and after his experience in Egypt during the last war he maintained a keen interest in tropical diseases. One of his great joys was to receive interesting specimens or blood-films from former house-physicians serving in the tropics.

"In W. T. Ritchie we have lost a chief who was also our friend, for whom no trouble was too great provided he could help us."

Notes and News

AMERICAN GIFT TO THE RSM

AMERICA has given much to Britain in the field of anæsthetics—perhaps the most notable gifts were from such men as Wells, Colton, and Morton, who gave the world nitrous oxide and ether anæsthesia—and the war has strengthened the close association between American anæsthetists and ours. Last week Colonel Ralph Tovell, consultant in anæsthetics to the American Army, presented a cinematograph sound projector to the Royal Society of Medicine from the American Society of Anæsthetists as a token of appreciation for the hospitality and coöperation experienced by American anæsthetists in this country. Dr. Frankis Evans accepted the gift on behalf of the section of anæsthetics and handed it over to Surgeon Rear-Admiral Gordon Gordon-Taylor, the president, for the use of the Society. Admiral Gordon-Taylor, as a surgeon, paid tribute to American anæsthesia, which had helped "to remove the dangers and bitterness of the waters of Lethe," and foresaw that the projector would be "no silent memorial but a resonant and lively reminder of American friendship."

WHAT ARE WE?

THE irruption of a physicist into the realms of biology, more particularly genetics, is unusual. Dr. Schrödinger, author of a slender book (*What is Life?* Cambridge University Press. Pp. 91. 6*s*.), apologises for his temerity, saying that some of us must venture to embark on a synthesis of facts and theories, or the purpose of our highest institutions of learning will be frustrated. He has done so to good effect. He points out that as chemical and physical "laws" are statistical and relate to the reactions of huge numbers of molecules they cannot be expected to be absolutely true of a gene. It contains only about a million molecules, and that number is much too small to entail an orderly and "lawful" behaviour according to physics. Consequently living matter may evade the laws of chemistry and physics. That does not mean that we shall never be able to give a simple picture of life, but that we cannot as yet do so. None the less he accepts that the body functions as a pure mechanism according to the laws of nature. But in an epilogue he unexpectedly comes down on the side of the mystics—the core of personality is one with God. Altogether an exciting, thought-provoking book.

PHOTOGRAPHY IN MEDICINE

THE Medical and Physical Society of St. Thomas's Hospital recently held at Godalming an exhibition of clinical photographs covering every aspect of medicine, including pathology, bacteriology, mass miniature radiography, and forensic medicine. Mr. Hennell, official photographer to the Medical Research Council, had lent his collection of coloured photographs of war wounds, and a series of films was also shown, including the British Council film on *Thoracic Surgery*, the Ministry of Health film on *Scabies*, and the recent film on *Spinal Anæsthesia*. Prof. T. P. Kilner, Mr. R. K. Bowes, Dr. J. W. McLaren, and Dr. Eric Gardner opened a discussion on the value of photography and the film in medicine. The students of St. Thomas's are to be congratulated upon their initiative and skill in organising the exhibition which was a convincing demonstration of the rôle photography has come to play in the teaching of medicine.

RELIEF

THE Society of Friends probably has more experience of international relief than any other body, for the Quakers have worked in most of the unsavoury areas of Europe in the last 25 years. An instructive little book,[1] to which Prof. J. R. Marrack contributes a preface, describes relief in Vienna after the last war and in Barcelona during the Spanish war. The problems were the same, yet remarkably different. The authors assign a central place to milk in the care of children, and they note how hard it is to prevent the administered food being sold on the black market. They insist, however, that relief does not begin and end with food; and clearly it is often better to give help at home than to allow children to be sent abroad. Difficulties not only of transport and supplies but also of coöperation with other relief organisations are frankly discussed, and all hoping to take part in a relief expedition should read their views. But why was the book called *Malnutrition*? It should have been called *Relief*.

1. Malnutrition (Quaker Work in Austria 1919–24 and Spain 1936–39). By Norah Curtis and Cyril Gilbey. (Oxford University Press. Pp. 87. 2*s*.)

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University of Cambridge

On March 2 the degrees were conferred by proxy of MD on N. H. L. Ridley and of MB, B Chir on Gerald Hartridge.

The Raymond Horton-Smith prize for 1943–45 has been awarded to Dr. F. T. G. Prunty for his essay on hyperfunction of the adrenal cortex.

University of London

The title of professor of chemical pathology in the university has been conferred on Mr. E. J. King, PH D, in respect of the post he holds at the British Postgraduate Medical School.

The title of professor emeritus of chemistry in the university has been conferred on Mr. R. H. Aders Plimmer, D SC, who held the chair of chemistry at St. Thomas's Hospital medical school from 1922 to 1942.

Mr. C. W. Shoppee, D SC, has been appointed to the university readership in chemistry at the Royal Cancer Hospital (Free). Since 1939 he has been working at the Pharmaceutical Institute in the University of Basle.

The degree of D Sc has been conferred on Major P. Granville Edge, a recognised teacher at the London School of Hygiene, and on Dr. William Evans, a recognised teacher at the London Hospital medical college.

Royal College of Physicians of London

Dr. Henry MacCormac will deliver the Lumleian lectures at the college on Tuesday and Thursday, April 17 and 19, at 4.30 PM. The title of his lectures is to be Prospect and Retrospect.

Faculty of Radiology

At 2.30 PM, on Friday, March 16, at the Royal College of Surgeons, Lincoln's Inn Fields, London, WC2, the diagnosis section will meet to discuss non-malignant conditions of the œsophagus. The opening speakers are to be Dr. A. S. Johnstone and Dr. R. A. Kemp Harper.

British Institute of Radiology

On Thursday, March 15, at 8 PM, at 32, Welbeck Street, London, W1, Mr. L. Dudley, AMIEE, will read a paper on the development of Stereoscopic Photography and Radiography.

Biochemical Society

The annual general meeting will be held at Middlesex Hospital Medical School, London, W1, on Saturday, March 17, at 2 PM.

Royal Eye Hospital, Southwark

On Friday, March 23, at 5 PM, Mr. P. M. Moffatt will speak to the clinical society of the hospital on orthoptics.

LCC Physiotherapy Staff

The massage staff of the London County Council are in future to be called physiotherapists instead of masseurs or masseuses. This change is in accordance with the policy of the Chartered Society of Physiotherapy, the name adopted more than a year ago by the former Chartered Society of Massage and Medical Gymnastics.

Association of Industrial Medical Officers

There will be a business meeting of the association at 11 AM on Saturday, March 24, at the London School of Hygiene, Keppel Street, WC1, and at 2.30 PM, Dr. W. Jeaffreson Lloyd, Mr. Joseph Minton, and Mr. T. C. Summers will open a discussion on ophthalmological problems and visual standards in industry.

Royal Society of Medicine

At the section of psychiatry on Tuesday, March 13, at 2.30 PM, Dr. J. Frank will describe psychological experiences in patients undergoing physical treatments. Dr. W. Mayer-Gross and Dr. L. C. Cook will also speak. On the same day, at 5 PM, at the section of experimental medicine and therapeutics, Dr. R. G. Macfarlane, Dr. Harold Scarborough, and Major J. Reid will open a discussion on blood coagulation. On March 14 the section of proctology will meet at St. Bartholomew's Hospital at 3.30 PM, and the section of physical medicine at St. Thomas's Hospital, SE1, at 4 PM. On March 15, at 5 PM, Prof. E. Meirowsky and Dr. Serge Keys will read a paper on the Paget cell to the section of dermatology. On March 16, at 6 PM, at the section of radiology Dr. John Wilkie will speak on radiology of the small intestine.

Tuberculosis Association

A clinical meeting will be held at 2.30 PM, on Friday, March 16, at the Hospital for Consumption and Diseases of the Chest, Brompton, SW3.

Medical Society of London

On Monday, March 12, at 5 PM, at 11, Chandos Street, W1, Dr. E. B. Strauss, Dr. L. C. Cook, and Mr. Wylie McKissock will open a discussion on modern methods of treatment in psychiatry. Dr. Eliot Slater and Dr. William Sargant will show a film demonstrating the technique of convulsion therapy.

Appointments

BROWN, J. W., MD LOND., FRCP: visiting consultant cardiologist, Peterborough Memorial Hospital.

CANNEY, R. L., MB CAMB., FRCS: acting surgical registrar and tutor, Guy's Hospital, London.

FEILING, ANTHONY, MD CAMB., FRCP: medical referee for the county-court districts of Uxbridge (circuit no. 34), Shoreditch and Windsor (circuit no. 39), Bloomsbury (circuit no. 42), Westminster (circuit no. 44), Kingston-on-Thames and Wandsworth (circuit no. 45), Woolwich (circuit no. 47) and the City of London.

HAJDU, NICHOLAS, MD PRAGUE, MRCS, DMR: temp. asst. in the radiodiagnostic department, St. George's Hospital, London.

KLEIN, N. N., MD BRNO, LRCPE, DMRE: radiologist, St. Helier County Hospital, Surrey.

MILLS, P. J., MRCP, DA: medical superintendent, Lister EMS Hospital, Hitchin.

PROCTOR, A. H., DSO, MD, MS DURH., colonel IMS retd: medical superintendent, Southport Emergency Hospital.

Births, Marriages, and Deaths

BIRTHS

ADLINGTON.—On March 1, at Sheffield, the wife of Mr. S. Roy Adlington, FRCS—a son.

ALLEN.—On Feb. 23, at Winchester, the wife of Dr. Wilfred H. E. Allen—a daughter.

BERRIDGE.—On Feb. 27, at Cambridge, the wife of Dr. F. R. Berridge—a daughter.

BION.—On Feb. 27, at Bournemouth, the wife of Major W. R. Bion, DSO, RAMC—a daughter.

BLACHFORD.—On Feb. 26, at Newmarket, the wife of Squadron-Leader R. D. Blachford, MRCP—a daughter.

BOWE.—On Feb. 22, at Cambridge, the wife of Wing-Commander J. C. Bowe, MD, RAF—a daughter.

GOODRICH.—On March 1, at Worthing, the wife of Dr. B. H. Goodrich, RAFVR—a daughter.

PETROVITCH.—On Feb. 27, in London, the wife of Dr. Milorad Petrovitch—a son.

RIPMAN.—On Feb. 26, at Ashford, Kent, the wife of Captain H. A. Ripman, RAMC—a son.

SAMES.—On Feb. 28, at Upton Grey, Hants, the wife of Mr. C. Patrick Sames, MS, FRCS—a son.

SCHOLEFIELD.—On Feb. 27, in London, the wife of Mr. John Scholefield, FRCS—a daughter.

TEGNER.—On Feb. 28, the wife of Lieut.-Colonel W. S. Tegner, RAMC, of Abbey Gardens, N.W.8—a son.

WETHERED.—On March 1, at Clifton, Bristol, the wife of Surgeon Lieut.-Commander R. R. Wethered, RNVR—a son.

WILLIAMS.—On Feb. 22, at Haverfordwest, the wife of Dr. M. H. C. Williams—a daughter.

MARRIAGES

JENNER—IMPEY.—On Feb. 26, at Sutton Coldfield, S. M. Jenner, MRCS, surgeon lieut.-commander, RNVR, to Margaret E. Impey.

STANFORD—BAKER.—On Feb. 14, at Jordans, Bucks, Geoffrey Brian Stanford, MRCS, DMR, FRPS, of London, to Pauline Jane Mary Baker, of Farnham Common, Bucks.

DEATHS

DICKIN.—On Feb. 25, at Brightlingsea, Essex, Edward Percival Dickin, MD EDIN.

GLOVER.—On Feb. 24, in Edinburgh, Henry Joseph Glover, MD EDIN., DTM, DPH.

LAMPLOUGH.—On March 4, at Alverstoke, Hants, Wharram Henry Lamplough, MD DURH., DPH.

MCCRACKEN.—On Feb. 22, at Melrose, James Smith McCracken, MD EDIN., formerly of Newcastle-on-Tyne.

OGILVIE.—In February, 1945, killed in action, Archibald Menzies Ogilvie, MB CAMB., captain, RAMC, aged 29.

RICHMOND.—On Feb. 26, at Trefriw, Benjamin Arthur Richmond, MD LOND., formerly of Ealing, aged 74.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

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DECORTICATION IN CLOTTED AND INFECTED HÆMOTHORACES

C. PRICE THOMAS, F R C S
SURGEON, WESTMINSTER HOSPITAL; ASSISTANT SURGEON, BROMPTON CHEST HOSPITAL; SURGEON, EMS THORACIC UNIT

W. P. CLELAND
M B ADELAIDE, M R C P
SURGICAL REGISTRAR, EMS THORACIC UNIT

HORTON EMERGENCY HOSPITAL

Illustrations on plate

HÆMOTHORAX is by far the commonest complication in chest injuries, for it may be associated with any of the various types of injury produced by blast or crushing in addition to penetrating and perforating wounds. Nicholson and Scadding (1944) recorded hæmothoraces in 187 of 291 cases of chest wounds. Ryle (1940) observes as high an incidence as 80%, while d'Abreu et al. (1944) mention 202 cases in 260 penetrating wounds of chest. In our own series of 750 chest injuries of all types there were 526 hæmothoraces, an incidence of 70%. It can be seen, therefore, that the management and treatment of hæmothoraces will occupy a considerable proportion of the available time and attention at a chest unit.

Hoyle (1940) emphasised the important differences between a simple hæmothorax, where the hæmothorax forms the main or the most important effect of an injury, and the compound or complicated hæmothorax, where the pleural blood is associated with a more serious or important injury to the lung, diaphragm, or chest wall. These latter cases almost all require active surgical treatment, and it is our experience that the associated hæmothorax if removed at the time of operation rarely causes further serious trouble. The simple hæmothorax presents rather a different problem; with adequate treatment the majority resolve rapidly and completely. The mortality and morbidity, however, in these cases almost entirely depend on the occurrence of infection or massive clotting in the hæmothorax. Tudor Edwards (1943) records an incidence of infection of 21·9% in hæmothoraces. Nicholson and Scadding (1944) find a third of their 291 cases infected, while d'Abreu et al. mention 77 infected cases out of 260. We observed 162 empyemata in 526 hæmothoraces—an incidence of 30%. Clotting of a hæmothorax is much less common; Nicholson and Scadding find 6% of 291 cases exhibiting clot formation, and in a later report Lush, Nicholson et al. (1944) record clotting in 10% of 426 cases. We found that 48 (9%) of our series of 526 hæmothoraces were clotted, the incidence in the various groups being as follows:—

Group	Total hæmothoraces	Clotted hæmothoraces
Dunkirk	61	4
Air-raids	143	6
Middle East	46	3
Western Europe	185	35
Other sources	91	nil

In this paper we propose to discuss the clinical and radiological features and treatment of clotted and infected hæmothoraces, and to describe the operation of decortication and its postoperative management.

Uninfected Clotted Hæmothorax

As far as we know no satisfactory explanation of the occasional occurrence of clotting, or perhaps more significantly the usual absence of clotting, in hæmothoraces has been put forward. The associated tissue damage with the liberation of thromboplastic substances may play a part. Wilson (1943) maintains that lung movements may defibrinate the blood so that extensive clotting is prevented.* Cardiac movements might similarly be implicated. He implies that biochemical examination of the blood in a fluid hæmothorax shows deficiency either in fibrinogen or in thromboplastic substances in most cases and suggests that one or other of these deficiencies is usually operating to prevent clotting. He says however that no one theory meets all cases. Dilution with serous fluid does not appear to be an important factor, since blood-counts and hæmatocrit estimations often indicate that, in the very early stages, a fluid hæmothorax is composed of almost pure blood.

Infection has been suggested as a cause but in many cases of massive clotting no organisms have been found even after a long and careful search. Undoubtedly infection occurs in some but by no means in a significant majority of cases. Nicholson and Scadding find 6 infected out of 12 cases of clotted hæmothorax; 18 of our 48 clotted cases were infected, and this represents an infection incidence almost identical with that for the whole series. Delay in aspiration has been blamed for the clot formation but if it is a factor it is not the sole one, since massive clotting has sometimes occurred at the time of the first exploration within a day or so of injury (see table I).

The increased incidence of massive clot formation observed in our casualties from the Western European campaign may possibly be due to the employment of intrapleural penicillin as a prophylactic against infection,* but in-vitro experiments have lent no support to this view. The extensive use of intrapleural penicillin has unfortunately been associated with a tendency to disregard the principles of early and frequent aspiration of blood from the pleural cavity so that many cases remain virtually unaspirated for a considerable period. An additional factor may be the high proportion of mortar wounds seen recently resulting in increased tissue damage. The ætiology of massive clotting obviously requires further careful investigation, particularly of a biochemical nature, for its elucidation.

The striking recent increase in the incidence of clotted hæmothorax can hardly be due, as Lush et al. suggest, entirely to improved diagnosis; base hospital conditions render this suggestion unlikely. However, in the earlier phases of the Western European campaign our units were treating the more seriously injured cases reaching this country, and these probably included an unduly high proportion of clotted hæmothoraces.

CLINICAL AND RADIOLOGICAL FEATURES

Two fairly distinct types of clotted hæmothorax have been encountered. One shows radiologically multiple pockets containing air and fluid separated by strands, bands, or sheets of fibrin. Pockets are often shut off from each other and their contents may vary from sterile serous fluid to frank pus. The second variety encountered is the massive clot. In these the clot is usually in one or a relatively small number of pieces, sometimes weighing as much as a pound.

The different appearances of these two types are, we believe, due to the presence of air in the pleural cavity in the early stages. Such air may have come from the lung or through the wound or have been intentionally introduced during air-replacement. It is unlikely that gas produced by anaerobic organisms can wholly account for the differences; many multilocular cases are sterile, while infection of a massive clot with gas-forming organisms gives rise to a sponge-like appearance radiologically. Gas-forming organisms undoubtedly accentuate the appearances of the multilocular variety, and in many such cases the gas in the loculi is found at operation to be under considerable pressure.

The physical signs of the clotted hæmothorax are essentially those of pleural fluid. In the multilocular cases areas of tympany and dullness may alternate. Breath sounds are usually absent but are sometimes present and bronchial in character. The occurrence of bronchial breath sounds depends on the state of the underlying lung and they are most usually heard when it is atelectatic. This probably accounts for the haphazard appearance of bronchial breathing in any type of hæmothorax. Bronchial breath sounds cannot, therefore, be of diagnostic importance in the clotted hæmothorax.

The radiological features are sometimes distinctive but are commonly the same as in any pleural effusion. In the multilocular cases the appearance of multiple fluid levels is characteristic but the condition may simulate the shadows thrown by the alimentary tract so that a diaphragmatic hernia may be suspected. Sometimes the fluid level is interrupted by the projection of a fibrin mass above the surface. Later cases with massive clotting show a sharply defined opacity as organisation and contraction proceed, and small clots may assume an

* See Sellors, T. H. *Lancet*, Feb. 3, 1945, p. 143 (published after this paper was written).

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oval or spherical shape resembling a chest-wall tumour or a peripheral growth of the lung.

DIAGNOSIS

Apart from the classical radiological pictures described above, the final diagnosis of clotting depends on the surgeon's inability to aspirate blood in reasonable quantities with an aspirating needle. Small quantities of blood can be aspirated even when a massive clot is present, because a little fluid blood is shut off in loculi in the clot. Too often, therefore, the aspiration of two or three ounces of fluid blood has led to the useless continuance of conservative treatment with unfortunate delay in the employment of more active measures. Inability to aspirate blood from a hæmothorax does not always mean that clotting has occurred. The aspiration site may be too low because allowance has not been made for the usual rise in the diaphragm after injury. Too small a needle may be employed, or the needle may be repeatedly blocked by small fibrinous tags floating in the fluid.

PATHOLOGY AND COURSE

Much blood can unquestionably be absorbed from the pleural cavity. But even in minimal cases there is a certain amount of organisation and fibrous tissue formation, as shown by the fact that small intrapleural injections of blood have been successfully employed for the therapeutic production of pleural adhesions. In the case of larger collections considerable fibrous tissue formation occurs; this may form a resistant corset often an inch or more thick around the lung between it and the chest wall, producing a condition suitably termed the "frozen chest." Organisation with fibrous tissue formation occurs with great rapidity in a hæmothorax, and apparently takes place earlier and is more extensive in clotted cases. This may well be due to the presence of a suitable fibrinous scaffolding. Histological examination of the coating on the visceral pleura in several hæmothoraces of less than two weeks' duration has shown well-developed fibrous tissue even at this early stage. Nearest the pleura the cells and their fibres lie parallel to the pleural surface, while more peripherally the cells are more vertically placed, the tissue is more vascular, and fewer collagenous fibres are present. The appearances are those of granulation tissue with scattered islands of fibrin among the cells. Still more peripherally is an irregular mass of fibrin and leucocytes. This appearance has been encountered in every case where the membrane on the pleura has been examined. It is true granulation and fibrous tissue, and represents the results of organisation of the blood. We cannot agree with Wilson (1943), or with Lush, Nicholson et al. (1944), who consider that the layer is fibrinous. It is possible that at first fibrin is deposited on the pleura but organisation follows so rapidly that for practical purposes the membrane must be regarded as composed of fibrous tissue.

TREATMENT

The treatment of the clotted hæmothorax has passed through interesting evolutionary phases during this war. We propose to outline these various methods and discuss their drawbacks and disadvantages. The present technique largely overcomes these disadvantages and ensures rapid re-expansion of the lung with a minimum of residual chest deformity and rigidity.

(1) *Natural absorption.*—Small clotted hæmothoraces can be absorbed or organised to such a degree that little residual disability remains. There are records of larger clotted hæmothoraces which have behaved similarly, but more commonly there is considerable fibrous tissue formation, often with calcification or ossification later, leading to a deformed and immobile or "frozen chest."

(2) *Simple evacuation of clot.*—This was the first active operative measure undertaken in an attempt to overcome the disabilities of the frozen chest. Success was achieved in some early cases; but in many the lung failed to re-expand fully and a residual pleural pocket remained, which in spite of repeated aspirations was gradually obliterated by fibrous tissue, leaving the crippling deformity of the frozen chest.

(3) *Evacuation of clot with decortication.*—It became obvious after a little experience with simple evacuation that decortication or removal of the fibrous tissue layer on the visceral pleura was required to permit the underlying lung to re-expand completely and obliterate the pleural space. In the smaller hæmothoraces local removal of this layer from the lung bordering the cavity was successfully employed. In the more extensive cases, however, it appeared advisable to decorticate and completely free the entire lung so that it could be allowed to expand into the thorax unhampered by any unnatural adherence. This seemed a desirable step because we found that on many occasions the lung became adherent in an unnatural position. The upper lobe "toppled over," and the apex became adherent to the chest wall well below its normal position. Such adherence prevented the lung from resuming its normal position after decortication. Again it was found that the diaphragm was often considerably raised and the costophrenic sinus obliterated. Mobilisation of the diaphragm and the diaphragmatic surface of the lung not only allowed the lung to descend into the sinus but also increased diaphragmatic mobility.

The ultimate success of the operation seemed to depend on obtaining rapid and complete re-expansion of the lung with obliteration of the pleural cavity. Failure to achieve this often left the patient little better off than before operation. If a pleural pocket remains fluid accumulates rapidly, and, although it can be removed at intervals by aspiration, pleural thickening with its train of disabilities soon follows (figs. 1 and 2). In many cases infection appears in these pockets with the consequent hazards and morbidity of an empyema.

Closure of the thoracotomy wound without drainage appeared to minimise the chance of early and complete lung re-expansion and has only occasionally been used. Simple drainage by a low posterior intercostal tube attached to a water seal was at first employed. However, early and complete expansion was not obtained, for the lower lobe expanded early, and, covering the tube, sealed it off from the remainder of the pleural cavity, leaving an anterior or apical pocket of air. Repeated aspirations failed to obliterate the space before a considerable degree of "pleural thickening" or infection occurred. In an attempt to overcome this pocketing a second tube was inserted into the apex of the pleural cavity through the second or highest available intercostal space between the scapula and the vertebral column. This tube was also attached to a water-sealed bottle. But once more early and complete re-expansion of the lung was not realised.

At this stage the effect of active suction was tried, employing a negative pressure of 4–6 cm. Hg. The results were dramatic, and even the most sluggish lung expanded rapidly and completely (figs. 3–8). Since then we have employed suction in every case, and so far have not failed to obtain full expansion of the lung and particularly of the apex. In some infected cases empyemata have recurred but these have been limited to the base while the upper lobe and apex of the lung have remained firmly attached to the chest wall, thus preventing a total empyema. Firm adherence between the decorticated lung and the chest wall appears to occur within 5–6 days. This is a factor of some importance, for a lacerated lung can in some cases be rendered "airtight" for several days by suture; if during this period the lung can be approximated and fused to the chest wall, the eventual bronchopleural fistula will be followed not by a total but by a localised empyema.

OPERATIVE TECHNIQUE

An intercostal posterolateral approach through the 6th space, with resection of a segment of the 6th rib posteriorly, is employed for all but the small localised cases. In this latter group the incision is placed over the affected area. Good wide access is essential if the apical and diaphragmatic regions are to be reached easily. Blood and clot are first removed from the pleural cavity. The lung is then found encased in a red smooth membrane, with little or no respiratory excursion. This membrane is carefully incised until the grey shining layer of visceral pleura is encountered. A plane of cleavage is readily found between the pleura and the fibrous coat, and the latter is carefully removed from the lung by blunt dissection using the finger or a large curved hæmostat either closed or with a small swab in its jaws. Care must be taken to avoid lacerating the

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TABLE I—RESULTS OF CLOTTED HÆMOTHORACES TREATED BY VARIOUS METHODS

Type of clotted hæmothorax	First aspiration: days after wounding	Organisms	Operation: time after wounding	Drainage	Result
NATURAL ABSORPTION					
Massive clot	13	Sterile	..	..	Poor; gross pleural thickening
Basal clot	6	Sterile	..	..	
Basal clot	18	Sterile	..	..	
EVACUATION OF CLOT					
Basal clot	?	Clostridia, streps.	1 month	Perm	Poor; total chronic empyema
Massive clot	..	Sterile	2 days	Nil	Poor; basal empyema
Localised clot	5	Sterile	6 weeks	Temp	Excellent
Basal clot	2	Sterile	18 days	Temp	Excellent
Massive clot	90	Sterile	3 mths.	Temp	Poor; large residual pocket
Basal clot	4	Gram-pos. bacilli	7 days	Temp	Fair; residual pocket and basal empyema
Massive clot	2	Sterile	4 mths.	Temp	Poor; large residual pleural pocket and gross pleural thickening
Multil. hæmoth.	7	Clostridia	3 weeks	Perm	Fair; basal empyema
Massive clot	2	Clostridia, staphs.	6 weeks	Perm	Poor; basal empyema
Multil. hæmoth.	8	Clostridia, staphs.	5 weeks	Perm	Poor; total empyema
Massive clot	12	Sterile	3 weeks	Nil	Fair; residual pocket; moderate pleural thickening
Massive clot	4	Sterile	14 days	Temp	Poor; residual pocket and empyema
Loculated	2	Sterile	8 days	Temp	Poor; residual pocket and empyema
Massive clot	14	Streps.	4 weeks	Perm	Poor; empyema
Massive clot	14	Sterile	18 days	Temp	Poor; empyema
Massive clot	7	Gram-pos. bacilli	4 weeks	Perm	Poor; total empyema
Massive clot	7	Sterile	20 days	Nil	Fair; residual pocketing and pleural thickening
Basal clot	5	Sterile	28 days	Nil	Fair; large residual pocket
Massive clot	5	Sterile	12 days	Temp	Good; moderate residual pleural thickening
Massive clot	2	Sterile	10 days	Nil	Fair; residual pocketing and pleural thickening
Massive clot	8	Sterile	24 days	Temp	Fair; residual pockets and moderate pleural thickening
Massive clot	3	Sterile	5 days	Temp	Fair; residual pocketing
Loculated	6	Sterile	9 days	Temp	Poor; residual pocketing and empyema
Loculated	5	Sterile	21 days	Temp	Poor; residual pocketing and empyema
Massive clot	7	Infected	15 days	Temp	Poor; residual empyema
DECORTICATION WITH SIMPLE DRAINAGE					
Loculated	4	Sterile	6 weeks	Temp	Poor; residual pocket and empyema
Basal clot	15	Sterile	17 days	Nil	Excellent
Loculated	6	Sterile	18 days	Temp	Fair; small residual pocket with pleural thickening
Loculated	8	Sterile	28 days	Temp	Fair; residual pocket with pleural thickening
Massive clot	10	*Ps. pyocyanea*	8 weeks	Perm	Poor; residual basal empyema
Loculated	3	Coliforms, streps.	3 weeks	Perm	Poor; total empyema
Loculated	5	Sterile	3 weeks	Temp	Good
Basal clot	1	Sterile	14 days	Temp	Excellent
Loculated	1	Sterile	18 days	Temp	Fair; small residual pocket and moderate pleural thickening
Massive clot	1	Sterile	5 weeks	Temp	Fair; several pleural pockets and moderate pleural thickening
Massive clot	3	Sterile	4 weeks	Temp	Fair; slow expansion of lung; moderate residual pleural thickening
Loculated	2	Sterile	9 weeks	Nil*	Poor; residual pocket; basal empyema
Loculated	2	Sterile	21 days	Temp	Fair; residual pleural pocket with moderate thickening
Loculated	3	Sterile	21 days	Temp	Fair; residual pocket and pleural thickening
Massive clot	2	Sterile	8 days	Temp	Fair; moderate residual pleural thickening
Massive clot	2	Sterile	12 days	Temp	Fair; residual pocket and pleural thickening
DECORTICATION WITH SUCTION DRAINAGE					
Massive clot	4	*B. proteus*, coliforms	3 weeks	Suct	Good
Massive clot	5	Sterile	4 weeks	Suct	Excellent
Loculated	6	Sterile	3 weeks	Suct	Good
Loculated	5	Sterile	4 weeks	Suct	Excellent
Massive clot	2	Sterile	24 days	Suct	Good; slight basal pleural haziness
Loculated	4	Sterile	4 weeks	Suct	Good

Temp = temporary; Perm = permanent; Suct = suction drainage.
Multil. hæmoth. = Multilocular hæmothorax.
* Local decortication only.

pleura but a number of small tears seem unavoidable. The complete lung, including the apex and the mediastinal and diaphragmatic surfaces, must be freed in this way from its rigid casing. Capillary oozing occurs from the lung surface but this is usually of little importance and soon ceases.

It is inadvisable to try to remove the coating from the lung immediately adjacent to a lung wound, whether healed or unhealed, for to do so merely results in considerable pulmonary laceration. In such cases the membrane is left intact for ½–1 in. around the wound. All lacerations of the pleura, either traumatic or operative, which still permit the leakage of air at the conclusion of the decortication should be sutured with fine catgut.

The next task involves mobilisation of the diaphragm. If the diaphragm is covered with a fibrous tissue coat this coat should be removed and the costophrenic sinus re-formed by breaking down the obliterating adhesions. The fibrous coating on the parietal pleura should then be removed as completely as possible. It is often a difficult task for purely mechanical reasons. However, less care is required in stripping except when the coat extends on to the mediastinum; it is often possible to remove the whole layer in 2–3 large pieces by dissection with the finger or a swab on a holder. Contrary to reported experience (Lush, Nicholson et al. 1944) bleeding has not been troublesome. The parietal is usually 2–3 times thicker than the visceral layer, and must, if left in situ, materially limit chest wall movements. We believe it is important to remove this layer to achieve the best functional results.

Intercostal drainage-tubes are now inserted into the apical and basal regions of the pleural cavity. The

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apical tube (no. 8 Jacques catheter) is inserted through the highest available intercostal space between the vertebral border of the scapula and the vertebral column, while the basal tube (medium bore straight tube with a side hole) is inserted at the rib angles about 2 in. from the lower limit of the pleural cavity. The thoracotomy wound is then closed in layers.

During and after the operation transfusion of whole blood is employed; 2–3 pints of blood is usually necessary, because shock may be severe, the patients are often poor operative risks, and hæmorrhage although rarely excessive may be significant.

Anæsthesia.—'Pentothal' with closed positive pressure intratracheal cyclopropane and oxygen has been used in most cases. Where fistulæ have been large, nitrous oxide, oxygen, and ether have replaced the cyclopropane.

POSTOPERATIVE MANAGEMENT

In the first place and for as long as demonstrable bronchopleural fistulæ are present both tubes are connected to water-sealed bottles. When the fistulæ have closed—usually about 12–36 hours after operation—both tubes are connected by a Y-shaped connexion to an electric suction pump. The pressure is reduced as rapidly as can be tolerated to 5–6 cm. Hg. In no case should suction be started until the patient is propped up on pillows after the operation. If suction is started when the patient is horizontal there is a danger that the upper lobe may seal the upper catheter and leave an anterior pocket of air shut off from the tube. Suction is maintained for 2–3 days, when, if the lung is fully expanded, the tubes are removed; precautions should be taken to see that no air leaks along the tube tracks after removal of the tubes.

Too early removal of the tube may occasionally result in pleural pockets of air from recurrence of a bronchopleural fistula, but after several days the lung has probably adhered to the chest wall and separation is then unlikely. If air pockets reappear after removal of tubes we consider it wise to insert a small catheter and reinstitute suction rather than rely on aspiration. Aspiration does not lead to the desired rapid re-expansion of the lung and so favours fibrous tissue formation.

In some cases a pleural exudate appears, particularly at the base, but in none of these have we been able to aspirate more than a few c.cm. of serous fluid and we believe that the exudate is largely fibrinous. Careful follow up shows that these exudates are fairly rapidly and completely absorbed.

RESULTS

Table I shows the results obtained in 50 cases of both sterile and infected clotted hæmothorax treated by the various methods already described. In many of the more recent cases, treated at transit hospitals, assessment was made relatively soon after operation, but even at this early stage it seems accurate. The cases in which suction drainage with decortication has been employed have been retained until convalescent. No final analysis can be made at this stage because the period since operation is often too short. In recording results, "excellent" implies full re-expansion of the lung with no demonstrable pleural thickening; "good" indicates full re-expansion with slight residual haziness seen radiologically; "fair" suggests pleural pocketing with moderate subsequent pleural thickening; while "poor" indicates gross pleural thickening or empyema formation.

Infected Clotted Hæmothorax

Infection occurs in about 30% of clotted hæmothoraces. Lush, Nicholson et al. record a higher figure of 21 out of 45 cases. There is not, therefore, a significantly higher rate of infection among clotted than among fluid hæmothoraces, though infection has been suggested as a factor responsible for clot formation.

Infection should be suspected in the presence of pyrexia, tachycardia, or leucocytosis; unexplained rapid loss of weight is often due to infection. It is not always possible to obtain bacteriological confirmation on aspirated material owing to the frequency of loculation and the fact that various loculi may exhibit markedly different cytology and bacteriology.

The radiological features are often distinctive. In the multilocular variety the loculi often appear to be under tension so that the cavities appear more spherical than usual. (These cases often exhibit visible enlargement of the affected side of the thorax.) In cases with massive clot the sponge-like mottling due to imprisoned gas bubbles is quite distinctive; gas-forming anaerobic organisms are usually found in these.

TREATMENT

(1) *Drainage.*—Earlier cases were subjected to a minor thoracotomy, usually placed at a low level where drainage would subsequently be employed. As much clot as possible was removed through the bed of a resected rib segment and the remainder left to liquefy. Drainage was then instituted through a tube placed either through the thoracotomy wound or at a lower level if the latter was placed too high. This procedure adequately controlled the infection but in many cases total empyemata resulted which slowly obliterated over a period of months or years leaving considerable final disability (figs. 9–11).

(2) *Sterilisation and decortication.*—Recently, with the advent of penicillin and in the light of experience with decortication, a much more satisfactory approach has evolved. The first aim is to sterilise the hæmothorax with penicillin if the organisms are sensitive. Three or four intrapleural injections of 60,000 units are made at intervals of 2 days. In many this will suffice to render the cavity sterile, but some cases, particularly the multilocular ones, are impossible to sterilise in this way owing to the difficulty of reaching all the pockets. In such cases it is useless to waste time in attempting sterilisation.

Thoracotomy with complete decortication is then carried out as already described and the decorticated lung expanded by active suction, using apical and basal tubes (figs. 12 and 13). We have employed a penicillin drip through the apical tube for 12–24 hours before employing suction, 100,000 units of penicillin being added to a pint of sterile water in a blood-transfusion bottle (EMS pattern) and the bottle connected to the apical tube with drip device. The rate of flow is adjusted so that a pint of fluid enters the chest in 18–24 hours (12–15 drops per minute). The penicillin drains out through the basal tube.

BACTERIOLOGY

Many and varied organisms may be found in an infected hæmothorax; the commoner ones are streptococci, staphylococci, pneumococci, *B. proteus*, *Ps. pyocyanea*, coliform organisms, and *Cl. welchii*. Several significant observations have been made during the postoperative course of decorticated infected cases.

(1) Streptococci and staphylococci, even though banished for some time from the hæmothorax by penicillin, show a tendency to recur in the discharge after decortication. The penicillin drip through the apical tube appears to prevent this reappearance in some cases.

(2) *B. proteus*, *Ps. pyocyanea*, and coliform organisms commonly disappear completely after decortication. In cases infected with these organisms alone the effluent discharge is often sterile and remains so. These organisms may in fact be saprophytic and will only persist while an empyema cavity remains. Once such a cavity is obliterated the organisms either die out or are effectively controlled by the defences of the body.

(3) *Cl. welchii* behaves in a peculiar way in the hæmothorax. It is well known that anaerobic gram-positive bacilli may be found in hæmothoraces where infection was quite unsuspected. Tudor Edwards (1943) points out that general signs of infection and toxæmia may only appear when infection with pyogenic cocci is added. We have been struck with the frequency of toxæmia in pure anaerobic infection in clotted as opposed to fluid hæmothoraces; it is possible that protein in the form of a gel instead of a sol may be one of the factors concerned in this difference. Clostridia do not persist in the pleural discharge after effective removal of blood or clot; it is most unusual to find them in the discharge even as early as 24 hours after decortication.

Empyema following Hæmothorax

Recent experience with clotted hæmothoraces—particularly the encouraging results of decortication and

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suction drainage—has led to a modification in the approach to the empyema following a hæmothorax.

CLOSED EMPYEMA

At the beginning of this war an infected hæmothorax was drained as soon as infection was suspected or organisms found in aspirated fluid. Results were not good and the incidence of total empyema was high. Early drainage was therefore soon replaced by repeated aspiration followed by drainage when the empyema was walled off by adhesion of the surrounding lung to the chest wall. Eventual healing and obliteration of the empyema was achieved in the majority without resort to other operative procedures such as thoracoplasty or a modified Schede operation. The time required for healing was in many cases long—sometimes more than a year—no doubt because of the excessive fibrous tissue formation on the visceral pleura.

When penicillin became available at the time of the Normandy invasion sterilisation of many empyemas was obtained by intrapleural injections, but as a rule pus continued to be formed and in most cases drainage was eventually required. The healing of such cases did not differ materially from that of the unsterilised cases, but the toxic phase was definitely shortened, and for this reason the introduction of penicillin was an important advance.

At this stage our successes with suction drainage after decortication in clotted hæmothoraces led us to experiment with infected fluid hæmothoraces. After preliminary sterilisation with penicillin, if suitable organisms were present, decortication was performed and the lung expanded by suction drainage (figs. 14–16). The results in a limited number of cases have been eminently satisfactory.

Suction drainage of an infected hæmothorax without decortication of the lung may produce obliteration of the pleural space, though chiefly at the expense of mediastinal displacement, for the lung cannot expand fully. Results in these cases have proved disappointing, for contrary to our preconceived ideas the lung does not readily adhere to the chest wall even though contact has been maintained for over a week; when suction is discontinued the lung often returned to its original position. Presumably the smooth fibrous tissue coverings on the visceral and parietal pleura do not encourage rapid fusion, so that mutual contact results in irregular or even complete absence of adherence.

OPEN OR DRAINED EMPYEMA

Emboldened by our success with closed empyemata, we next tried decortication in drained empyemata and total pyothoraces. Once more the results have been highly satisfactory. In the majority complete expansion of the lung has occurred, the organisms have disappeared from the pleural cavity, and rapid cure of the empyema has resulted (figs. 17–19). In some of the total pyothoraces basal collections of pus have formed and required drainage, but the upper lobe has fortunately remained adherent to the chest wall and a total empyema has thus been avoided.

On the whole these patients are not as suitable for operative procedures as the former groups because their general condition is usually poor—they are pyrexial, toxic and wasted. Sometimes large open wounds or drainage holes are present at the site of election for the thoracotomy incision. In many the scapula is fixed, preventing access to the sixth space, and in most cases crowding and fixation of the ribs limits exposure. For these reasons the operation is technically more difficult and the patient less well able to stand a major operation. In spite of these drawbacks we are convinced that the operation is more than justified and in every case effects tremendous improvement if not rapid cure.

The results in a small series of both drained and undrained empyemata are recorded in table II. In every case considerable gains followed the operation. In all but 2 cases the empyema rapidly resolved in a few days; in 1 case, with a total empyema and a large ulcerated area of lung, expansion of the upper lobe was obtained but a small basal empyema developed which was obliterated a few weeks later. In the other case local decortication with removal of a pleural foreign body was employed but the lung did not expand fully after operation, so that coliform organisms persisted in the effluent and the patient retained a small basal empyema which is rapidly healing. Most of these cases were seen some weeks after injury and the onset of infection; by this time considerable deformity with loss of mobility of the chest was already present combined with excessive "pleural thickening." These factors reduced the prospects of achieving excellent results with no residual pleural fibrosis.

TABLE II—RESULTS OF EMPYEMATA TREATED BY DECORTICATION AND SUCTION DRAINAGE

Type of empyema	Organisms	Operation: weeks after wounding	Complete (C) or local (L) decortication	Result
Total drained ..	*Ps. pyocyanea*, *B. proteus*	8	C	Good; complete expansion; moderate pleural thickening
Total undrained	Streps., *Ps. pyocyanea*	6	C	Ditto
Large drained ..	*B. proteus*, coliforms, streps.	10	L	Fair; small residual empyema
Total undrained and lung abscess	*Staph. aureus*	6	C	Excellent; full expansion; no residual pleural thickening
Total drained ..	Coliforms	10	C	Fair; complete expansion of apex; basal empyema healed in 6 weeks
Total drained ..	Hæm. streps.	5	C	Excellent; full re-expansion; slight pleural thickening
Basal undrained	*Staph. aureus*	8	L	Excellent; slight residual pleural thickening

Conclusions and Summary

Early and complete obliteration of the pleural space is the most important single factor in the prevention of pleural sepsis and its elimination when once established.

Earlier methods of treating clotted hæmothoraces were attended by incomplete or considerably delayed lung expansion; at the best such methods led to considerable deformity of the chest which in later life causes severe respiratory embarrassment. Less fortunate cases were left with severe and prolonged pleural infection, which is largely responsible for the base hospital mortality.

The employment of decortication with suction drainage fulfils the basic principle of early and complete re-expansion of the lung. We feel certain that the method will reduce markedly both the mortality and the morbidity of this serious group of cases and will correspondingly lessen the anxiety of those charged with their management.

Hæmothoraces occurred in 526 (70%) cases in a series of 750 chest injuries. Infection was present in 30% and clotting in 9% of the hæmothoraces.

The clinical and radiological features of the massive clotted and loculated hæmothorax are described.

Our present method of decortication with suction drainage is described with operative details and management; the results in a limited series of hæmothoraces have been considerably better than those of earlier procedures.

A small series of both drained and undrained empyemata following hæmothoraces have also been treated by decortication and suction drainage. The results recorded are far superior to those achieved by present-day methods.

We wish to thank Mr. N. R. Barrett for permission to include some of his cases in this series.

REFERENCES

d'Abreu, A. L., Litchfield, J. W., Hodson, C. J. (1944) *Lancet*, ii, 197.
Edwards, A. T. (1943) *Ibid*, i, 97.
Hoyle, C. (1940) *Proc. R. Soc. Med.* **34**, 75.
Lush, R. W., Nicholson, J. C., Stevenson, C. R., Nicholson, W. F. (1944) *Lancet*, ii, 467.
Nicholson, W. F., Scadding, J. G. (1944) *Ibid*, i, 299.
Ryle, J. A. (1940) *Ibid*, ii, 63.
Wilson, J. V. (1943) *Brit. med. J.* i, 470.

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X RAYS IN DIAGNOSIS AND LOCALISATION OF GAS-GANGRENE

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Illustrations on plate

IN the present war cases of gas-gangrene have been far fewer than they were in 1914–18, but the disease still remains one of the principal causes of death from wounds. According to MacLennan and Macfarlane (1944) the case-fatality rate has been about 50%.

Gas-gangrene may follow the most trivial wound. In war-time, anaerobic infections of wounds occur very frequently; but in nearly all cases, with efficient treatment, the infection is overcome. If attention to the wound is delayed, the organisms may multiply in blood-clot or dead tissue without serious ill effects, but once they start to invade healthy tissues the disease may run so swift a course that the patient is dead within a few hours.

Everyone admits that successful treatment of gas-gangrene depends on its early recognition. Even the experienced surgeon finds this very difficult, and he must not amputate a limb which can be saved, nor procrastinate until it is too late to save the patient's life.

War Memo No. 2 (1943) gives the early symptoms and signs of gas-gangrene as follows:

(1) Increasing pain in the wound area, with possibly the appearance or increase of local swelling.
(2) A rising pulse-rate in the absence of continued hæmorrhage and after shock has been overcome.
(3) A change in the mental attitude of the patient, which is difficult to define with accuracy; this change may be one of mental apathy or sometimes euphoria, with or without restlessness.
(4) A wound which is relatively dry, or, at most, shows a thin discharge, the exposed muscle and fat at times being stained a plum colour from hæmolysis.

Occasionally, unexplained attacks of vomiting may occur in the early stages.

Unfortunately, not one of these signs alone is sufficiently distinctive, and if all are present together the patient's condition is already grave. Some method is required for examining suspicious cases which will establish an early diagnosis; with this some reduction in the fatality-rate might be achieved.

DIAGNOSIS BY X RAYS

During the last war a number of observers noted that it was possible to detect gas in the tissues by means of X rays. In this country Dr. J. F. Brailsford is our foremost authority. He believes that it is possible to give an immediate answer to the question, "Is there any evidence of gas-gangrene?", long before the infection has produced serious clinical signs.

In the early days of the present war, limbs were amputated because gas was detected by X rays. The men who did these amputations can have known little about gas-gangrene and still less about radiology, but unfortunately they influenced more experienced surgeons, who in turn taught that radiology was useless in the diagnosis of gas-gangrene. In *War Memo No.* 2 the value of radiology is dismissed in a few words, "In some cases gas bubbles may be seen in X-ray films taken before operation, and this finding may be of value in supporting the diagnosis of an anaerobic infection. It should be remembered, however, that gas may be shown apart from the existence of true gas-gangrene, and that its extent often has no relationship to the clinical state."

Our Russian allies seem to have had more success and have achieved a notable reduction in the case-fatality rate. In a review of 171 cases of gas-gangrene collected during the first Finnish campaign, Ryvline (1940) reports that radiography is a valuable ancillary enabling one to study the distribution of gas bubbles. Out of 171 cases 131 were X rayed and 105 showed gas in the tissues. Though in 26 cases no abnormality was detected, Ryvline holds that X rays are capable of revealing gas formation before clinical signs appear and that early repeated examinations of suspicious cases are valuable. The total fatality-rate in this series was 7·6%; several other Russian sources have reported fatality-rates below 20%.

The use of X rays in the diagnosis of gas-gangrene is not just a matter of detecting gas, for there are several causes other than gas-gangrene which give rise to gas in the soft tissues.

AIR IN THE SOFT TISSUES

All fresh wounds, even a tiny needle puncture, may permit air to enter the tissues. Sometimes gas crepitations may be detected clinically, or bubbles may be seen in the depths of the wound, but in most cases air is not observed unless the part is radiographed.

Air appears as radiotranslucent bubbles, pockets, or streaks in the soft tissues (fig. 1). It is seldom confined to the track of the wound, being widely dispersed in the surrounding loose cellular spaces. Air may extend throughout the entire length of a limb, but it never infiltrates the muscles unless it is forced in under pressure.

The amount and distribution of air in the tissues vary, according to whether the wound is open or closed, and with the amount of tissue which has been lost. Air in the tissues is seldom detected in ordinary civilian casualties. One reason for this is that the radiograms of injured persons are usually taken to show the bones, and definition of the soft parts is obscured or lost in the blacker parts of the negative. A more important reason is that in most cases the injured part is soon put at rest by efficient first-aid. If a wounded part is not immobilised, movements, active or passive, tend to suck air into the tissues. A recent case illustrates this point.

A young man who had sustained a pitch-fork wound in his leg was seen in hospital 6 hours after the injury. He had a temperature of 100° F and a raised pulse-rate. Crepitations could be felt in his thigh and around the knee-joint. The wound was slightly uncomfortable and the tissues around it were a little tender. Radiograms showed bubbles of gas in the popliteal space, in the subcutaneous tissues of the leg and in the knee-joint. The surgeon was worried because he could not explain the presence of gas, but further questioning disclosed that the patient had walked two miles to the nearest doctor without a dressing. The radiographic appearances were not alarming, for the gas was almost certainly air. The surgeon disclosed a dirty wound involving the knee-joint. The patient made a complete recovery.

In war-time civilians are exposed to the same conditions as Service men. In a series of air-raid casualties, radiographed within 6 hours of injury, considerable quantities of gas were visualised in 19 out of 31 cases, and nearly all the remainder showed traces of gas in the tissues. These cases were treated quickly and efficiently and did very well. I believe that the explosive forces were in part responsible for so much air in the tissues, for none of these patients had any protection from blast; they were working in the open and in some cases their wounds were very small. A recent experiment seemed to prove this point: a human cadaver was exposed to a relatively small explosive force applied to the foot, which caused a small wound in the thigh, and radiographic examination showed a large quantity of gas in the limb with a distribution similar to that observed in many clinical cases.

Battle casualties may show a great deal of air in the tissues. In a series of recent casualties who were evacuated by air ambulance from France and radiographed within 6 hours of admission to hospital, gas was recorded in the tissues in 89 out of 331 cases. In many cases only single projections of the injured part were taken and no special attempt was made to see or record every gas bubble. These included 7 cases of gas-gangrene and a number of others where the gas was almost certainly due to local formation by organisms in the wound. In most cases there was no reason to suspect that the gas was not air, for the men were kept under constant clinical observation and some were re-examined radiographically; within 3 days most of the gas had disappeared.

AIR ESCAPING FROM AN INJURY TO THE LUNGS

In one of our recent cases (fig. 2) a radiogram of the chest showed gas outlining the fibres of the pectoralis major muscle on the left side, as well as well-marked subcutaneous emphysema in the neck and the left arm.

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The patient had a small penetrating wound of his chest in the pectoral region and with each breath he could be seen to blow air from his chest into the pectoral muscle. The radiographic picture of this muscle was very like the appearance given by fulminating gas-gangrene.

Dr. Brailsford recorded similar findings in 1941, and he tells me that he has since seen a similar case where air was infiltrating the trapezius. He thinks that the same changes could be seen in any muscular wound which communicates with the respiratory passages. There is no difficulty in making a correct clinical diagnosis in these cases.

EFFECT OF TREATMENT ON THE PRESENCE OF AIR

Once the injured part is placed completely at rest, air is quickly absorbed. In 24 hours the amount is considerably less, and within 3 days all but a trace has gone. The rate of absorption seems to vary in different tissues, being quicker from muscle and synovial membrane than from areolar tissues. If the tissue is dead there is no absorption of air.

Air does not disappear so quickly if the injured part is not kept at rest, probably because more air is sucked in. By rest I mean complete immobilisation, but in practice this is not always possible or even desirable. From a radiographic standpoint, the best splint is probably a plaster gutter which can be removed for radiography. The various forms of frame splinting are all open to the suspicion that they allow some movement, and if the injury is near one of the natural flexures it is almost impossible to introduce a radiographic cassette without varying the amount and distribution of air in the tissues.

Many other factors in treatment may influence the radiographic picture. Air can be introduced by changing a pack, removing a stitch, or by irrigation. In a recent case X rays showed a great deal of air which had been introduced without the surgeon's knowledge during the manipulation of an intramuscular penicillin drip. Soft paraffin gauze tends to impair the absorption of air and holds it in pockets on the skin or in the wound. When the tissue spaces have become sealed off manipulations do not usually suck more air into the tissues, but any subsequent operation may permit air to enter.

Thus the treatment adopted must be considered when assessing the significance of gas bubbles in the tissues.

LOCAL FORMATION OF GAS

Local formation of gas in the depths of a wound by gas-forming organisms gives radiographic appearances which closely resemble those given by air (fig. 3). As a rule, it is impossible to differentiate this gas from air except by serial radiographic examinations, and only then if the observer is acquainted with all the details of the patient's treatment subsequent to his accident.

Civilian cases rarely present any difficulties, for most patients receive efficient treatment. If any considerable quantity of gas is observed 2 or 3 days after injury, there is a strong probability that the gas is due to secondary anaerobic infection. Battle casualties present much more difficult problems. In our recent series, about a third of all cases which had been injured 2 or 3 days previously had gas in the tissues. I believe that in most cases this gas was air, for it quickly disappeared as soon as the wound was cleansed and the part immobilised. Nearly all these men were remarkably fit on admission and most of them did very well without further surgical intervention, but in a few cases the surgeons suspected local anaerobic infection and resected portions of semi-necrotic muscle.

Local gas formation does not necessarily mean invasion of the living tissues by organisms, for as a rule the bubbles form in a hæmatoma, around a foreign body or in dead tissue. In such cases there may be no clinical signs of infection and the radiographic signs do not in themselves demand surgical intervention (fig. 4).

It is very difficult to decide when gas-forming organisms have begun to invade the loose cellular tissues. The fact that the wound is dirty, inflamed, and foul smelling only means that inflammatory reaction is taking place and does not necessarily show which organism is responsible. If gas can be felt crackling in the subcutaneous tissues, or can be seen bubbling from the depths of the wound, this does not mean that the gas is necessarily due to gas-forming organisms, for it may be air. Even the presence of anaerobic bacteria means nothing beyond the fact that the wound is infected, and many wounds so infected show no trace of gas. The only confirmed cases of spreading anaerobic cellulitis I have seen were not associated with any general toxæmia and showed only slight local signs of inflammation. Anaerobic cellulitis almost always accompanies true gas-gangrene, and gas formation in the loose cellular tissues is often detected radiographically in advance of an infection in the muscles, whereas clinically there is often but little indication of its presence except when the gas is subcutaneous.

TRUE GAS-GANGRENE

True gas-gangrene is a progressive infiltration of muscle and the loose cellular tissues with gas-forming organisms. As the infection spreads through living tissues, there develops a severe toxæmia, which if allowed to continue brings about the death of the patient.

In our recent series of battle casualties we have records of 7 cases. The radiographic appearances of these 7 cases were similar and quite distinctive, but clinically it was possible to divide them into two groups.

Group 1.—This comprises 2 cases of acute fulminating infection of living tissues. In both these cases the vascular supply to the part was not seriously impaired, the development of the infection was extremely rapid, the toxæmia was profound, and within a few hours of recognition of the disease the patients were dead. The histories of these cases are as follows.

CASE 1.—Bombadier, aged 32 years. July 3, 1944: Injured at 7.10 PM in right arm, right chest, and spine, producing paraplegia; also gunshot wound of back, involving abdomen and spine; given blood-transfusion and sulphanilamide.

July 4: *Operation:* toilet to wounds; entrance and exit wounds of the right arm anteriorly through biceps and coraco-brachialis.

July 5: Admitted to military hospital in England; given sulphathiazole 2 g. followed by 1 g. hourly with fluids; T 102·2° F, P 116, R 22 per min.

July 6: Two necrotic wounds in right arm dressed with sulphathiazole powder; T 103·4° F, P 130.

July 7: Condition much worse; T fell from 101° to 97° F and pulse-rate rose from 120 to 135; severe pain in right arm, which was extremely swollen and tender in both upper and lower parts; right hand blue and mottled but still warm. Dressing of right arm; wounds more necrotic and evil smelling; swab taken from both wounds; insufflation of penicillin and sulphathiazole powder, followed by tullegras dressing. At 9.30 AM given penicillin 20,000 units intramuscularly, to be repeated two-hourly. At 11.30 AM given 45,000 units anti-gas-gangrene serum (AGGS) intramuscularly. Nutrition of hand now impaired by gross swelling and œdema of arm and forearm; hand mottled blue and white, and cold. X ray* (fig. 5) showed gas infiltration of some of the muscles of the arm and forearm. Swab from wounds: gram-positive bacilli, with spores. At 12.30 PM given 90,000 units AGGS intramuscularly. At 2.30 PM patient died.

Autopsy confirmed the clinical findings. Detailed bacteriological studies are not complete.

CASE 2.—Corporal, aged 40 years. At midnight on July 17–18, 1944, sustained a shrapnel wound in his back. Dressed at casualty clearing station and evacuated by air.

July 18: Admitted to the Radcliffe Infirmary. X ray disclosed large foreign body in dorsal region lying in paravertebral muscles on the left side. T 100° F, P 100, R 20 per min. *Operation* at midnight on July 18–19: wound edges excised; wound treated with sulphanilamide powder and closed.

July 19: Patient comfortable; T 100° F, P 120, R 20; receiving sulphanilamide by mouth 6 g. daily.

July 20: Foreign body localised with the aid of fluorescent screen. T 98° F, P 70, R 20. *Operation:* deep collection of greyish pus found around the foreign body which was removed; no signs of gas; bleeding points controlled; sulphanilamide powder introduced; drainage-tube inserted.

July 21: Pain in back below operation region; well-marked pitting œdema of whole back; T 97° F, P 110. X ray of chest advised to exclude pulmonary complication. At 12 noon referred to X-ray department. At this time he was pale, sweating, and in pain; there was considerable œdema of the back, where the muscles were extremely tender and hard.

* I am indebted to Major H. Davies for the radiograms of this case.

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A diagnosis of gas-gangrene was made and radiograms (fig. 6) were taken of the muscles of his back. These showed pronounced pectination of the muscles of the erector spinæ group on the left side. Patient's condition on return to ward fair. He continued to take drinks and hold a rational conversation. Given 22·5 c.cm. polyvalent AGGS intravenously. At 4 PM he suddenly became distressed and at 5 PM he died.

Comment on group 1.—In both these cases of fulminating gas-gangrene the condition was first recognised 6 hours before death. In both the first and only radiographic examination showed that the disease was far advanced. It would have been possible to make an earlier diagnosis by means of X rays many hours or even days previously.

Group 2.—These patients had all sustained severe damage to the blood-supply of a limb. Anaerobic bacterial infection occurred in the infarcted muscles. Clinically, 1 patient was desperately ill on admission, 2 others had some slight toxæmia, and the other 2 developed the infection while the surgeon was awaiting a line of demarcation before amputating for simple gangrene of the extremities.

CASE 3.—Rifleman, aged 21 years. June 26, 1944: Mortar wounds of left leg and left wrist. When he was first seen he was severely shocked. Evacuated to CCS, where he was found to have a penetrating wound just above flexure of left knee and a through-and-through wound of calf; the left foot was cold and no dorsalis pedis pulsation was detected.

June 28: *Operation:* wounds excised; hæmatoma evacuated from left leg; given 40,000 units AGGS intravenously and 5 c.cm. of penicillin solution (strength not stated) intramuscularly; no damage to tibial vessels detected; blood-transfusion given; evacuated by air ambulance.

June 29: Admitted to Radcliffe Infirmary. Some pain in left calf; left leg and foot cold and blue; no pulsation in dorsalis pedis and peripheral vessels detected. His wounds were smelling, and there was no plaster or splint on the leg. T 97° F, P 120. Seen by Mr. Max Page, who pointed out the characteristic earthy odour, the cold dead appearance of the foot and the toxic condition of the patient. He considered that the picture was typical of anaerobic infection and that the leg required amputation. Crepitations could be felt in the muscles of the calf and in the thigh. The thigh was tense and tender. *Operation:* Leg amputated 2 in. above femoral condyles and vessels ligated; sulphonamide powder introduced; penicillin therapy begun.

For 24 hours after operation the patient's condition was very poor and it was feared he would die, but in the next 12 hours he recovered.

Bacteriology: *Staph. albus* and *Cl. welchii* isolated.

Comment.—The infection in this case was secondary to vascular ischæmia of the limb. The man was admitted to hospital 3 days after he had sustained his wound and by this time his condition was critical.

CASE 4.—July 12, 1944: Gunshot wound of left popliteal region with compound fracture of left femur and severed popliteal vessels. At 3.50 AM, exploration of wound at No. 52 Forward Surgical Unit; popliteal artery and vein found to be severed and sciatic nerve bruised but not cut; ligation of vessels; wound toilet; Tobruk plaster. On admission to a General Hospital, complained of pain in leg; toes cold and somewhat swollen, but plaster did not seem tight.

July 13: Surgeon thought toes were becoming gangrenous, probably due to vascular involvement, but advised evacuation to be proceeded with. Penicillin 150,000 units given intramuscularly between July 12 and 13.

July 14: Admitted to Radcliffe Infirmary. T 103° F, P 130, R 25 per min. Patient toxic, complaining of pain in leg; anterior half of foot white, cold, and anæsthetic; could not move toes; blood-pressure 130/60 mm. Hg. Radiograms taken on admission showed fracture of lower end of femur. Soft tissues obscured by plaster.

July 15: At 3 AM plaster removed; thigh not swollen or tender; X ray (fig. 7) showed pectinate appearance of calf muscles and gas in loose cellular planes of thigh. Diagnosis: gas-gangrene. Amputation above knee performed, to eradicate principal source of toxins. Condition after operation very poor; blood-pressure 60/30 mm. Hg. Given a blood-transfusion and penicillin therapy continued. Given 43 c.cm. of polyvalent AGGS in 24 hours.

July 16: Patient's condition had steadily improved. Amputation wound sutured. Gas in the thigh had disappeared. Penicillin discontinued.

No bacteriological findings are available. Unfortunately the leg was not examined after amputation.

Comment.—The radiographic appearances in this case were almost identical with those of case 3, but, clinically, the patient's toxæmia was not so serious, probably because the infection had not spread so far into the living tissues.

CASE 5.—Private, aged 18 years. July 18, 1944: Wounded at 10.30 AM; compound fracture of left femur; perforation wound of left thigh; left leg cold and pulseless; large hæmatoma of thigh. *Operation* at No. 16 CCS. Exploration of wound on inner side; femoral artery and vein found divided in Hunter's canal; both ligatured. Exploration of outer wound; compound fracture of lower third of femur with a lot of bits, which were removed; much muscle destruction; strong smell. Debridement; sulphanilamide powder inserted and Thomas splint applied; 20,000 units AGGS given and penicillin drip started. Later, leg was still pulseless and devitalised. Note: "Will require amputation." For immediate air evacuation.

July 19: Admitted to Radcliffe Infirmary. T 99·5° F, P 135, R 25 per min. Left lower leg cold, discoloured, pulseless, and necrotic. Some discomfort in thigh but no definite pain. Crepitations in thigh just above knee-joint. X rays (fig. 8) showed gas infiltration involving anterior crural group of muscles. *Operation:* Wound was smelling typically of gas-gangrene. Leg amputated from middle of thigh. Plasma drip set up and 27,000 units AGGS given into the drip; given 20,000 units penicillin daily.

July 24: Since operation patient's general condition had progressively improved. Temperature had been normal for 3 days. Pulse-rate dropping. Penicillin therapy stopped. Amputation stump dressed; felt normal and looked healthy; no pus.

Examination of the amputated limb confirmed the clinical and radiographic findings. No bacteriological findings are available.

Comment.—Localised gas-gangrene involving part of the anterior crural group of muscles. It is probable that the affected muscles had been partly deprived of their blood-supply.

CASE 6.—Private, aged 20 years. July 8, 1944: Compound fracture of right humerus. When seen at No. 36 Forward Transfusion Unit he was very shocked; given 4 pints blood and 84,000 units penicillin. Seen at No. 56 Forward Surgical Unit at 2.30 PM; given AGGS, 22,500 units; blood drip

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MR. PRICE THOMAS, DR. CLELAND

Figs. 1 and 2—Loculated clotted hæmothorax. Fig. 1: before decortication. Fig. 2: 10 days after evacuation of clot and decortication with simple drainage, showing residual lateral pockets with much pleural thickening.

Figs. 3 and 4—Massive clotted hæmothorax. Fig. 3: before operation. Fig. 4: 5 days after evacuation of clot and decortication with suction drainage, showing full re-expansion of lung and very slight pleural thickening.

Figs. 5–8—Massive clotted hæmopneumothorax with whole lung adherent to basal part of chest. Fig. 5: before operation. Fig. 6: 24 hours after decortication, lower tube sealed off by expanding lower lobe leaving residual fluid, above which the edge of the unexpanded upper lobe can be seen. Fig. 7: 48 hours after operation and 12 hours after the institution of suction; lung now fully expanded. Fig. 8: 10 days after operation, showing rapid absorption of fibrinous exudate.

Figs. 9–11—Massive clotted hæmothorax. Fig. 9 shows total empyema and atelectatic lung after evacuation of clot in June, 1940. Fig. 10 shows appearances in 1942 with gross pleural thickening and mediastinal displacement. Fig. 11: bronchogram in October, 1943, showing small size of lung and the extent of the pleural thickening. This man still has a small residual empyema nearly 5 years after injury.

Figs. 12 and 13—Massive infected clotted hæmothorax. Fig. 12 shows dense opacity at base with some pocketing at apex; aspirated fluid contained *B. proteus*, coliform organisms, and streptococci. Fig. 13: 21 days after evacuation of clot and decortication with suction drainage, showing full expansion of lung with some residual thickening.

Figs. 14–16—Large closed *Staph. aureus* empyema. Fig. 14 shows abscess containing rib fragment in dorsal area of lower lobe; upper lobe adherent to pericardium; fluid level at base with bullet lying in costophrenic sulcus. Fig. 15: 24 hours after decortication with suture of lung abscess, lung aerated and half expanded. Fig. 16: 5 days after operation, upper lobe fully expanded; fluid level at base with no separation of upper lobe from chest wall. Abscess in dorsal area of lower lobe smaller. Subsequently the pleural fluid and air were completely absorbed and the lung abscess disappeared. Bronchography at a later date showed a dilated dorsal branch of the lower lobe bronchus, complete expansion of the lung and minimal pleural thickening. Clinically the patient was fit for discharge 4 weeks after operation.

Figs. 17–19—Total drained empyema following infected hæmothorax. Fig. 17 shows lung aerated but poorly expanded; both visceral and parietal pleura already much thickened. With suction this lung expanded slightly, and could be approximated to the chest wall with much mediastinal displacement; no fusion occurred after maintaining apposition for 9 days. Fig. 18: 48 hours after decortication with suction, lung fully expanded: no mediastinal displacement. Fig. 19: 6 weeks after operation, now fit for discharge; moderate residual pleural thickening with fully expanded lung.

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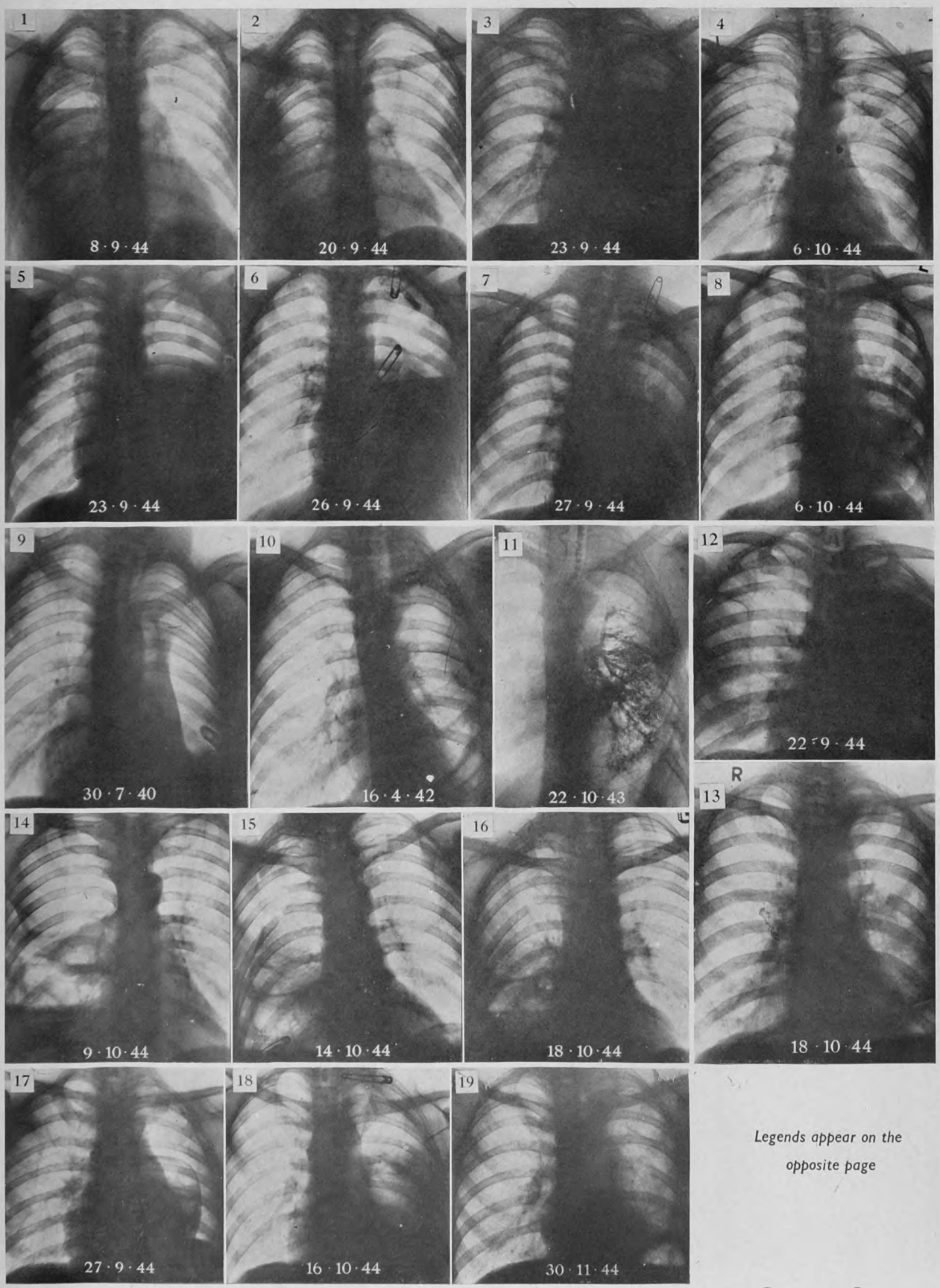
MR. THOMAS, DR. CLELAND: DECORTICATION IN CLOTTED AND INFECTED HÆMOTHORACES



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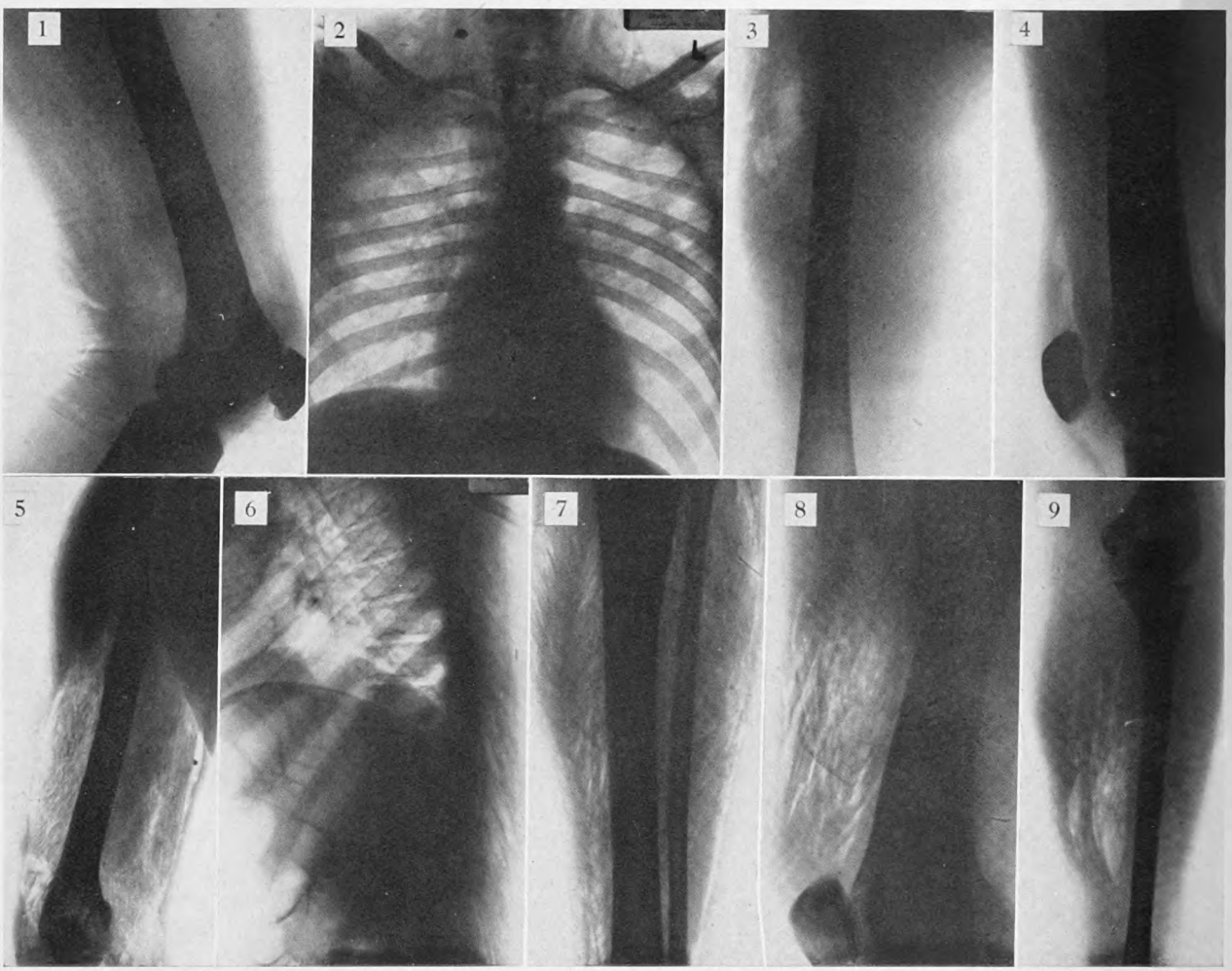
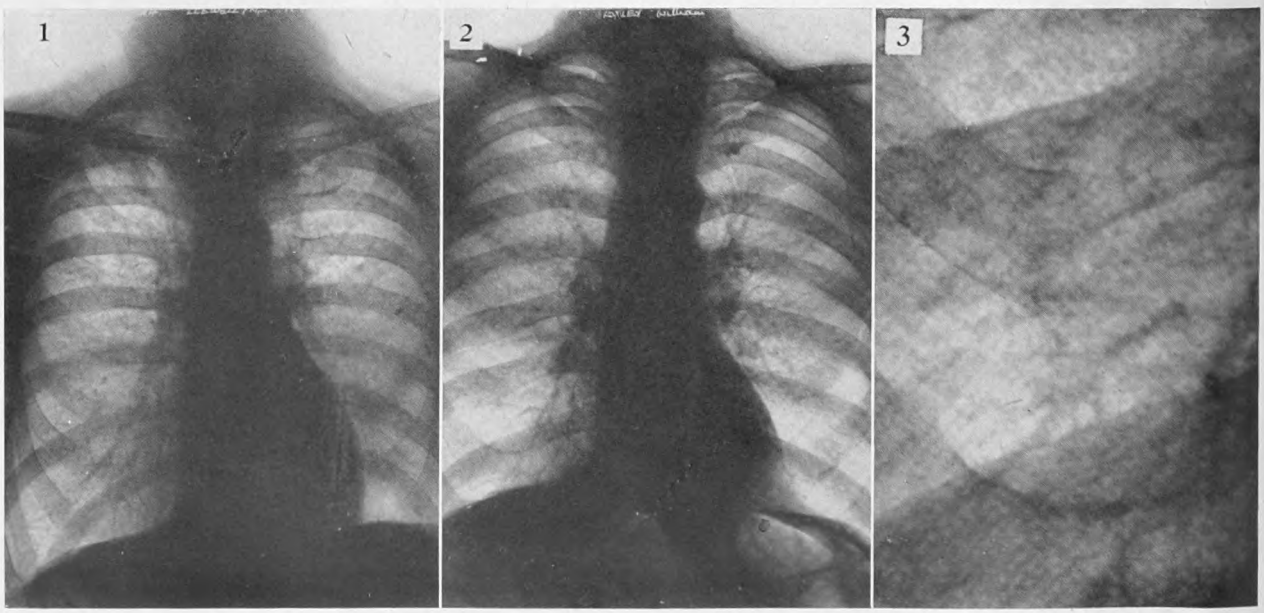
DR. KEMP: X RAYS IN DIAGNOSIS AND LOCALISATION OF GAS-GANGRENE



DR. McLAUGHLIN AND OTHERS: IRON OXIDE DUST AND THE LUNGS OF SILVER FINISHERS



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given in theatre; wounds explored, found to have comminuted fracture of lower third of humerus; forearm cold, blue and pulseless, anæsthetic and paralysed; entry wound on inner aide; artery partly severed; radial nerve severed.

July 10: Admitted to Radcliffe Infirmary. Commencing gangrene of the hand; no radial or ulnar pulse; no sensations as high as the mid-forearm; T 98° F, P 90, R 20 per min.; systemic penicillin therapy begun. *Operation:* Two large wounds over elbow-joint. Median nerve and brachial artery found to be cut; wounds cleansed; radius had been fractured; plaster applied. There was no further excision of the wound.

July 21: Over past 10 days the patient's pulse and temperature had been steadily rising. Temperature now 102° F, P 120, R 25. It had been decided to wait for demarcation of the dead forearm, but in view of the patient's general condition operation was decided on. *Operation:* Patient taken to the theatre; plaster removed; X rays taken; pectinate appearance in muscles of forearm; amputation performed a little above middle of arm, a lower amputation being impossible because the muscles were frankly gangrenous.

Bacteriology: *Cl. welchii* isolated. Examination of the limb confirmed the clinical and radiographic findings.

Comment.—Gas-gangrene secondary to vascular ischæmia. Mild toxæmia. Patient had been on penicillin therapy throughout, but in view of the ischæmic condition of the muscles it was unlikely to combat the infection in the dead tissue. After operation the patient made an uneventful recovery.

CASE 7.—Corporal, aged 22 years. July 9, 1944: Gunshot wound of both arms at 1.35 PM; compound fractures of both arms. Seen at No. 22 Forward Surgical Unit; general condition very poor; condition of right arm hopeless; left arm pulseless (? brachial artery injury). *Operation* at 6.30 PM; condition very serious; circular amputation of upper third of right arm; toilet to wound on anterior surface of left arm; artery intact (? ulnar nerve injury).

July 10: Muscles of left forearm tense and swollen; no splints or bandages on. Question whether bone fragment was causing injury to the brachial artery; position of arm adjusted, but no improvement; plaster slab applied to arm; for evacuation.

July 14: Admitted to Radcliffe Infirmary; T 100° F, P 95, R 20.

July 15: General penicillin therapy started.

July 19: Temperature had remained high since admission; P 90; had been given continuous drip transfusion. *Operation:* Excision of deep fascia of forearm made on account of swelling.

July 20: Hand warm; no signs of gangrene; X rays showed local gas near the compound fracture of humerus; no signs of gas-gangrene.

July 22: T 100° F, P about 110; hand warm; no visible signs of gangrene. X rays (Fig. 9) showed considerable gas in the anterior muscles of forearm. *Operation:* Mr. Page tried to conserve the forearm by excision of the gangrenous radial group of muscles, but it proved impossible to eradicate the whole of the injured tissue. Amputation carried out at the junction of the mid and proximal thirds of the forearm. All damaged muscle excised.

July 25: T 100° F, P 110. Patient still looked very pale but was very well considering the severity of his injuries; was still being given penicillin and sulphathiazole.

Aug. 10: Secondary suture of left stump.

Aug. 29: Patient discharged. Wounds healed.

Bacteriology: *Cl. welchii* isolated.

Comment.—Gas-gangrene secondary to primary vascular ischæmia.

Comment on group 2.—The radiographic findings in this group bear no strict relationship to the degree of toxæmia. In cases 3 and 4 the radiographic pictures were almost identical and the distribution of the gas was similar, yet case 3 was desperately ill while case 4 was only slightly toxic. It is not difficult to offer an explanation for these findings; in case 3 the infection had spread from the dead to the living tissues and toxic absorption could readily take place, whereas in case 4 the infection was still practically confined to the dead tissue and toxic absorption was minimal. Cases 4 and 5 required amputation of the limb because part of it was already dead; the anaerobic infection of the muscles in these cases would have been important if operation had been delayed and the infection had spread to the living tissues. Cases 6 and 7 illustrated the importance of repeated examinations of a dead limb while waiting for a line of demarcation; in both these cases the development of anaerobic infection in the dead tissues precipitated operation, for both these patients were beginning to show signs of toxæmia.

DIFFERENTIATION BETWEEN GAS IN TISSUES AND LOCAL EXTRAVASATIONS OF FREE FAT

Anyone who studies soft tissue X rays of the injured must be aware of the normal relative translucencies between the main groups of muscles; these are due to fat. In some cases, especially in old or middle-aged people with flabby muscles, the radiograms show multiple linear streaks in the muscles which are due to fatty replacement; this picture at first sight may resemble the appearance of acute fulminating gas-gangrene, but if care is taken to examine the whole limb the observer will notice that the change is not confined to any one group of muscles and bears no relationship to the clinical signs. In a difficult case a radiogram of the opposite side will help by showing the same appearances.

It is not widely known that after injury there are often local collections of free fat in the loose cellular spaces around the injured part. This fat is revealed as radiotranslucent patches or streaks in the tissues. As a rule the translucency is not so great as that produced by gas, but at times it is difficult to detect a difference. Bubbles almost always mean gas, but streaks or irregular translucent patches may be due to gas or fat. Some help is given by serial radiographic examinations, for air disappears quickly whereas fat may persist for several days. If there is a fatty accumulation in a joint—i.e., a lipohæmarthrosis—the fat tends to rise to the surface to form a top layer and a lateral radiogram taken from the side shows a fluid level; this picture resembles air in the joint. In fat people, especially in the region of the buttock, radiography may reveal many linear streaks in a bruised muscle which are due to fat; these appearances resemble the earliest stages of gas infiltration of a muscle and cannot be distinguished at a single radiographic examination.

CLINICAL APPLICATION OF FINDINGS

No-one should despise the information which can be obtained from a radiological examination of the distribution of gas in a wound and the surrounding tissues. A better understanding between surgeon and radiologist might help to solve some of the problems of wound surgery.

Every surgeon knows that he cannot hope to eradicate infection from a wound by excising devitalised tissues and cleansing the cavity, although a few notable men believe that this is possible by excision of the wound under strict aseptic conditions. Radiological studies seem to prove that the more conservative measures are sound practice, for they show that, even at the time of injury, foreign matter is drawn into the tissues to places

Legends to Illustrations

DR. KEMP

Fig. 1—Air in the tissues. Bubbles of air in popliteal space. The original film showed many other bubbles and streaks extending as high as the hip region.

Fig. 2—Muscular wound communicating with the thorax. Note air in the left pectoral muscle. Picture simulating gas-gangrene.

Fig. 3—Local gas formation in a wound of the thigh. (Identical appearances can be given by air.)

Fig. 4—Local gas formation in the knee-joint. A film 24 hours previously showed no gas. Patient given continuous penicillin therapy. Next day the patient was much better. All gas had disappeared. Clinically the infection resolved.

Fig. 5—Gas-gangrene. Case 1: Infiltration of the muscles and subcutaneous tissues with gas.

Fig. 6—Gas-gangrene. Case 2: Infiltration of the left paravertebral muscles with gas.

Fig. 7—Gas-gangrene. Case 4: Infiltration of the muscles and subcutaneous tissues with gas.

Fig. 8—Case 5: Localised gas-gangrene affecting the anterior crural muscles.

Fig. 9—Case 7: Gas formation in necrotic muscle. Note "ghost shadows" of the muscle fasciculi. The infection developed 13 days after the injury.

DR. McLAUGHLIN AND OTHERS

Fig. 1—Chest of case 4, 1936.

Fig. 2—Chest of case 1, 1938. Fig. 3—Lung texture shown full size.

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far distant from the wound track. Air is foreign matter, and unless it is in some way filtered by passage through the tissues it must carry organisms far beyond the reach of even the most radical surgical toilet. The fact that no harm results from the more usual surgical procedures only serves to emphasise the amazing resistance of healthy tissues.

For the same reasons we can infer that prompt and efficient immobilisation of an injured part is sensible first-aid, yet this measure is often forgotten if there is no obvious fracture. A recent case illustrates the point.

A stout middle-aged woman sustained a dirty wound in her left buttock. The wound was cleansed, the skin edges sutured, a drain inserted and she was sent home. Twenty-four hours later she was seen again complaining of severe pain in her buttock some distance from the actual wound. There had been practically no discharge from the tube. Her buttock was very tender but not tense. Temperature, pulse, and respirations were normal. Radiograms showed some gas in the muscle planes of the glutei. In view of the clinical features the possibility of early gas-gangrene was considered. Further questioning disclosed that the woman had been walking about. She was put to bed. Twelve hours later there was less gas and the wound was comfortable. She made a complete recovery without any special treatment.

The most important fact which radiology does establish is that the finding of gas in the tissues does not necessarily indicate anaerobic infection of the wound, and that in the majority of cases the gas is really air. These points are easily appreciated if there are no clinical signs of wound infection but easily overlooked if there is any cause for anxiety, more especially in military cases. When a surgeon discloses discoloured and friable muscles in a wound which is 2 or 3 days old it may seem very suspicious to find bubbles of gas, but if there are no signs of invasion of the healthy tissues it is almost certainly safe to do no more than resect the damaged tissues. A doubtful case should be kept under constant clinical observation and repeated radiographic control.

The value of radiology in the detection of local gas formation in a deep hæmatoma, around a non-opaque foreign body or in a joint cavity, is too obvious to call for further comment.

I cannot give a complete estimate of the value of radiology in the diagnosis of gas-gangrene, for I have not seen enough early cases, but I strongly repudiate the suggestion that X rays are valueless. In every case reported in this paper a correct diagnosis was established without delay and it was clear that a positive diagnosis could have been made many hours earlier. Yet I doubt whether it is always possible to recognise the early stages of invasion of the tissues by gas-forming organisms. In the heavier parts of the body it is easy to miss one or many gas bubbles in the tissues in a single antero-posterior projection. To avoid mistakes the greatest care must be taken to examine the patient clinically, and rotate the limb or position the tube so that the suspected part is uppermost. A projection taken from the side is probably the most important. In experiments on a human cadaver, I found that as much as 3 c.cm. of air could not be detected in the muscles of the thigh in a single anteroposterior radiogram, but lateral projections showed bubbles as small as 0·25 c.cm. Even the most numerous examinations do not always bring success unless the examiner takes into account the clinical features. In case 5 I requested the radiographer to take single projections of the thigh, the leg, and the foot. When the films were examined at first sight they seemed to show nothing abnormal, but a more careful examination revealed a little gas in the muscles just at one edge of the film. Clinically this was the site of the suspected infection. A further film showed the changes quite clearly (fig. 8).

The selection of suitable cases for radiographic examination is of the greatest importance. Every new case admitted to the accident service of a hospital should be examined at least once, preferably as soon as possible after admission. The difficulty is to know which cases should be followed up, since it is impossible to examine repeatedly every case which has gas in the tissues, especially where large numbers of cases are concerned. Clinically, I have made it a rule to re-examine every patient who complains of increasing local pain or discomfort in the tissues around his wound. As a rule, three-hourly examinations are sufficient, but in some instances, where the clinical course changes rapidly, it may be necessary to examine the patient every hour. If a limb is encased in plaster a radiographic examination is useless and the plaster should be removed.

I do not believe that there are any characteristic clinical signs of early gas-gangrene. Many wounded show slight signs of general reaction and a few may be profoundly ill from other causes. The local signs are very difficult to assess. I am in complete agreement with those authorities who maintain that crepitation is not a reliable guide. As a rule crepitations cannot be felt unless there is gas in the subcutaneous tissues and I doubt whether gas crepitations can be felt in the muscles unless the muscles have already disintegrated. There is no reason why any case should not be radiographically examined. The patient will suffer no harm, for he need not be moved or exposed. If the radiographic findings are suspicious the surgeon need do no more than keep the case under observation, but if the local condition does not improve, or grows worse, the examination should be repeated, for serial radiographic examinations offer incontestable evidence of gas formation.

If spreading gas-gangrene is established, the radiologist should secure a complete examination of the entire limb or part affected. Some years ago I saw a reputable surgeon amputate through muscles which I knew from the radiographic appearances were widely infiltrated with gas, without recognising that the infection was present. He was under the impression that he had eradicated the infection, but it was clear that he had not and shortly afterwards the patient died. It is a fact that at operation it may be very difficult to recognise that the muscles are infiltrated with gas. They may look normal and there may be no ordinary crepitation, though it may be possible to recognise a difference in texture when cutting the muscles with a knife.

The surgeon need not necessarily remove all the infected tissues; it is sufficient to remove the infected muscles and use chemotherapeutic measures to overcome any infection which has been left behind in the loose cellular tissues. In our recent series this procedure was successful in cases 3, 4, and 6.

SUMMARY

An account is given of the clinical and radiological features of 331 battle casualties admitted to a hospital in Great Britain. The report deals in detail with the radiographic appearances of air in the tissues, local gas formation, and gas-gangrene, and gives a detailed account of the clinical application of these findings.

I am indebted to Mr. Max Page, surgeon in charge of the accident service, and to the surgeons of the Radcliffe Infirmary for their permission to see and examine these cases, and to all the medical officers who contributed to the records. Details of the pathological findings were provided by Dr. A. H. T. Robb-Smith and Dr. W. J. D. Fleming. I should like to record my appreciation of the staff of the X-ray department, whose energy and enterprise made the work possible.

REFERENCES

Brailsford, J. F. (1941) *Med. Ann.* p. 486.
MacLennan, J. D., Macfarlane, M. G. (1944) *Brit. med. J.* **1**, 683.
MRC War Memo No. 2 (1943) Notes on Gas Gangrene: Prevention; Diagnosis; Treatment. London.
Ryvline, J. B. (1940) *Khirurgiya*, No. 9, p. 31. Abstract in *Bull. War Med.* 1942, **2**, 445.

LAWSON TAIT CENTENARY.—Celebrations in connexion with the centenary of Lawson Tait (1845–99) will be held in Birmingham at the end of June. Tait was the first professor of gynæcology at the then Mason University College, and the Midland Medical Society, the Women's Hospital, and the university are sponsoring the arrangements.

WEST END HOSPITAL FOR NERVOUS DISEASES.—The out-patient department of this hospital is open as usual (with daily clinics excepting Saturday) at Welbeck Street, London, W1 (entrance in Marylebone Lane). Inpatients are at present accommodated at Princess Louise Hospital for Children, Kensington.

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IRON OXIDE DUST AND THE LUNGS OF SILVER FINISHERS

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Illustrations (1–3) *on plate*

THE term "siderosis" was applied by Zenker (1866) to what he regarded as a pathological condition of the lungs caused by long-continued inhalation of the dust of iron or iron oxide. The word has usually been taken to mean that iron dust, like the dust of free silica, sets up a fibrotic reaction in the lung tissue. In this paper we hope to show that at least one form of iron dust does not in fact bring about fibrosis of the lungs and that some of the shadows seen in radiographing the chests of workers who inhale iron dust do not represent pathological changes but are caused by aggregations of opaque dust in the lungs.

SILVER FINISHERS AND IRON OXIDE DUST

Silver finishers or polishers inhale iron oxide dust at work and 3 such workers were examined clinically and radiographically by two of us (A. I. G. McL. and J. L. A. G.) in 1936. A 4th case was seen in the outpatient department of the Sheffield Royal Hospital in 1938. In each of these 4 cases the X-ray picture of the lungs was comparable with that found in electric arc welders. One of the 1936 cases died in July, 1943, after an operation for gastric ulcer. The lungs and other organs of this man have been studied histologically, and chemical estimations of iron oxide and silver in the lungs have been made. The question of the opacity of iron oxide to X rays has been further examined by means of sponges soaked in graded suspensions of iron oxide.

Silver polishers use "rouge" or "crocus" for the final polishing of silver and of silver-plated articles. Both substances are composed of iron oxide (Fe_2O_3) in a finely divided form, rouge being made from iron sulphate by a process of calcination, and crocus by refining iron pyrites. These polishing powders are refined to a high degree of purity and are free from acid and grit. Crocus is reddish purple and rouge has the familiar red colour of rust, but the tint can be varied in manufacture by altering the temperature of calcination. Silver articles are polished sometimes by "handing," that is, by rubbing the articles with the thenar eminence of the hand coated with rouge, but more usually by pressing them against a revolving "dolly" made up of many layers of cotton cloth to which a mixture of rouge and water has been applied. Sometimes rouge "compo," a mixture of rouge and grease in cake form, is applied to the dollies. Polishing by hand is not a dusty process but a good deal of dust is thrown from the revolving dollies even when they are under exhaust ventilation.

Formerly the rouge used to be mixed with oil and not so much dust was evolved, but more recently it has become the practice to mix the rouge with water for application to the dollies, and after the water evaporates the rouge dust is freely liberated into the air of the workrooms. The reason for the change is that the articles are not as heavily plated as they used to be, and the work can be done more quickly and with the removal of less silver with water-mixed than with oil-mixed rouge. In a silver-polishing workroom iron oxide dust mixed with fluff from the cotton dollies settles on the benches, floors and rafters. The fluff and dust also contain a little silver. In the room where the silver finishers mentioned in this paper worked, about 14 oz. of silver is collected from the dust each half-year. Silver finishers therefore are liable throughout their working hours to inhale iron oxide dust, with less cotton dust, and still less silver.

The first three men (cases 1–3) were asked to attend for examination because they were working as silver finishers and not because they complained of ill health.

CLINICAL AND X-RAY EXAMINATIONS

CASE 1.—A. B., aged 54 in 1936, had been employed as a silver finisher for 40 years and had done no other work. He had had no serious illnesses. His father and 4 brothers had died of "grinder's disease" (? silicosis and/or tuberculosis) and his mother of spinal paralysis. He said that he felt very well but he had had a slight cough for 10 years, and that after a day's work he coughed up copious reddish-black sputum, but he made no complaint of dyspnœa.

Clinical examination showed that his chest was somewhat barrel-shaped, suggesting emphysema. The chest movements were restricted and the percussion note over the whole of the lung fields was moderately hyper-resonant. The breath sounds were distant and no adventitious sounds could be heard. The heart was normal and no abnormalities were noted in the other body systems except that the sclerotics of both eyes were greyish-blue, presumably through staining by silver. No patches of argyria were seen in the skin. The sputum contained numbers of macrophages filled with granules which gave the prussian-blue reaction for iron.

X-ray examination of the chest showed slight peaking at the upper border of the right diaphragm suggesting pleural adhesions there; the heart was normal in size and position and both lung fields showed generalised stippling or reticulation with some increase of linear striation.

The post-mortem and histological appearances of this man's lungs are described below.

CASE 2.—C. D., aged 34 in 1936, had been a silver finisher for 20 years and had done no other job. His family history revealed no relevant details and his own health record was good. His only complaint was a slight cough of some years' duration together with copious red-black sputum after a day's work.

Movement was diminished at the left apex and the percussion note was normal over the whole of the lung fields. The breath sounds were generally clear and vesicular except that at the left apex the expiratory sound was prolonged and blowing. No adventitious sounds were heard. The other body systems were normal and the sclerotics showed no argyria. The sputum contained macrophages filled with iron oxide granules.

X-ray examination showed that the diaphragms were normal, and that the heart was asthenic in type but situated normally. Over both lung fields there was an increase of linear markings, more pronounced in the upper half of the left lung. Calcified nodes were present at the left hilum. Stippling or reticulation was seen over both lower lung fields, especially at the left base.

CASE 3.—E. F., aged 57 in 1936, had been a silver finisher all his working life (40 years) except for 3 years' Army service during the 1914–18 war. He had had no illnesses during this period and had not been gassed. There was nothing relevant in the family history. His previous health had been good and he had no symptoms except slight cough and red-black sputum after work.

He was a well-nourished, rather obese, man, with slight argyria of the eyeballs. No abnormal signs could be detected over the lung fields and nothing abnormal could be found in the heart on ordinary examination. The tension of the pulse was somewhat raised but unfortunately a sphygmomanometer reading was not taken. There were no clinical signs or symptoms such as dyspnœa, pain on exertion or œdema to suggest that the heart was not functioning well. The sputum contained macrophages filled with iron oxide granules.

X-ray examination showed that the diaphragms were normal. The heart shadow was of the "boot-shaped" type with some enlargement of the ventricles. Over the lung fields there was some increase of the linear markings especially on the right side. Stippled shadows were present over both lower lobes. The radiologist's conclusions before he knew the occupation were as follows: "the shape of the heart suggests the possibility of hypertension, part of the changes in the lungs probably being due to this. There is some fibrosis of the lungs of the type seen in early silicosis."

The fourth man spontaneously attended the outpatient department of the Sheffield Royal Hospital complaining of gastric symptoms of 15 years' duration.

CASE 4.—G. H., aged 52 in 1938, had worked as a silver finisher for 38 years—i.e., since he was 14. His father and brother had both died recently of pulmonary tuberculosis.

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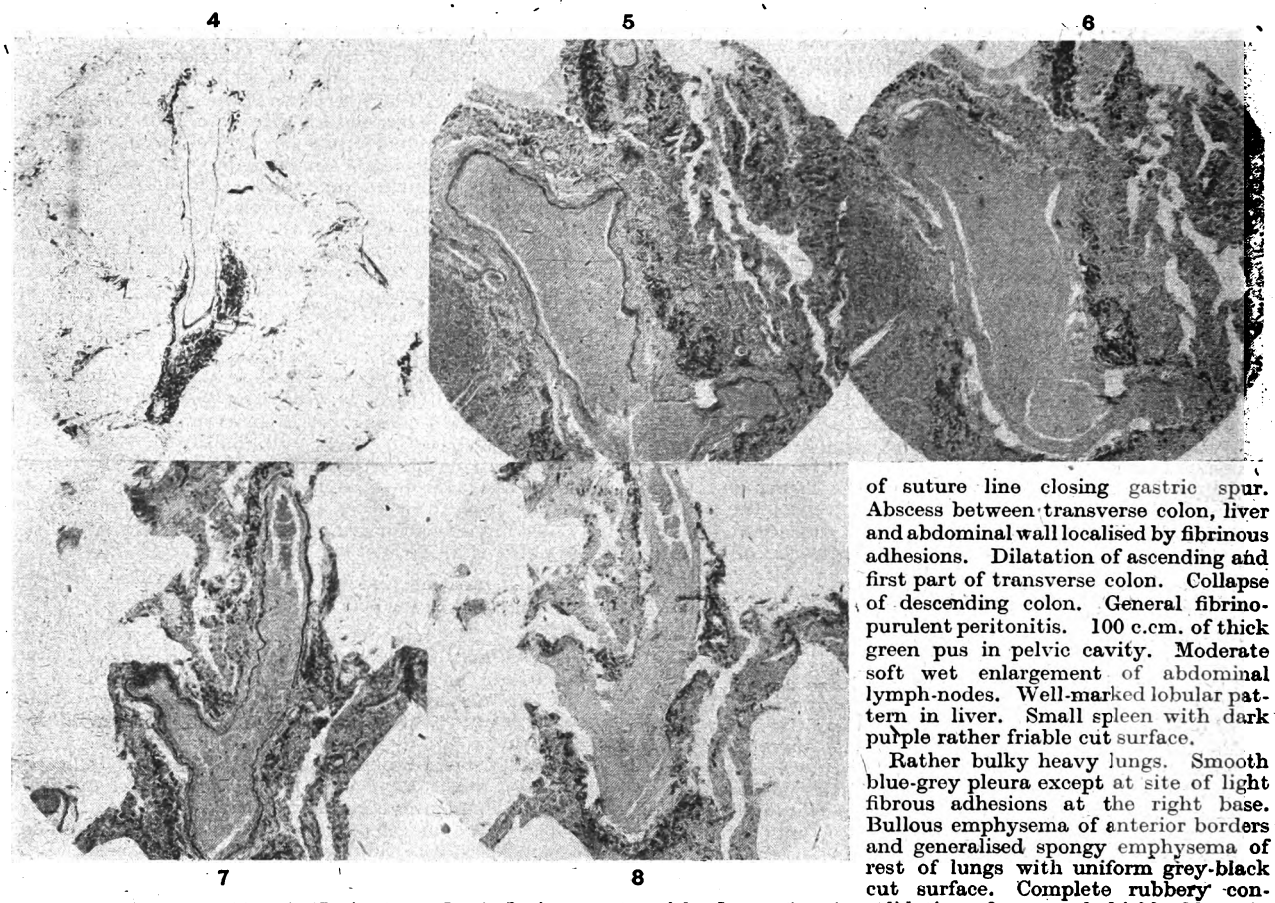

Fig. 4—Unstained section of lung (× 17) showing aggregate of pigment-containing cells and fine linear pigmentation.

Fig. 5—Section of lung (× 36) stained hæmatoxylin and eosin.

Fig. 6—Duplicate section of fig. 5 treated with KCN before staining. Note loss of pigment in artery wall and alveolar walls.

Figs. 7 & 8—A similar pair to figs. 5 and 6 (× 36).

He had no symptoms or signs pointing to a chest condition but in view of the family history the chest was radiographed (fig. 1). The radiologist found a general fine fibrosis and in both infraclavicular zones "mottling which suggests a Koch's infection. The fibrosis of the lungs is probably related to his occupation." Two months later he reported: "The findings are similar to those previously described, that is, of silicosis." Full investigation of the alimentary system revealed nothing to account for the gastric symptoms, and a final diagnosis of inactive pulmonary tuberculosis was made.

It is noteworthy that in all these 4 cases the X-ray appearances were at first attributed to "early silicosis."

SUBSEQUENT FINDINGS IN CASE 1

On July 3, 1943, 6½ years later, A. B. was admitted to the Sheffield Royal Hospital with a 6 weeks' history of continuous and increasing epigastric pain. He had worked at silver finishing up to 10 days before admission. A diagnosis of gastric ulcer (? malignant) was made and a partial gastrectomy was done. He died on July 28 from peritonitis and bronchopneumonia.

During his stay in hospital clinical examination of the respiratory system revealed few abnormalities until the onset of the terminal bronchopneumonia. The chest was barrel-shaped and a few fine crepitations were heard at both bases. Argyria of the sclerotics was noted. On July 13 the radiologist, who did not then know the man's occupation, nor that he had been radiographed previously, reported that "the whole of both lung fields presents an opaque, finely reticulated appearance often seen in hæmatite workers. The condition is probably occupational in origin" (figs. 2 and 3). Comparison with the film taken 6½ years earlier showed no essential alterations.

Autopsy was performed 23 hours after death.

Extremely dehydrated emaciated edentulous man. Recent partial gastrectomy and anterior gastrojejunostomy. Rupture of suture line closing gastric spur. Abscess between transverse colon, liver and abdominal wall localised by fibrinous adhesions. Dilatation of ascending and first part of transverse colon. Collapse of descending colon. General fibrino-purulent peritonitis. 100 c.cm. of thick green pus in pelvic cavity. Moderate soft wet enlargement of abdominal lymph-nodes. Well-marked lobular pattern in liver. Small spleen with dark purple rather friable cut surface.

Rather bulky heavy lungs. Smooth blue-grey pleura except at site of light fibrous adhesions at the right base. Bullous emphysema of anterior borders and generalised spongy emphysema of rest of lungs with uniform grey-black cut surface. Complete rubbery consolidation of a curved shield of lung in the posterior borders of both lower lobes containing scattered pale nodules of frank pus. Thin yellow pus throughout bronchi. Considerable œdema of both upper lobes. No visible fibrosis of lungs. Moderate enlargement (largest 1·8 cm. diameter) of reddish brown hilar and mediastinal nodes. Slight hypertrophy and dilatation of right ventricle (wall 0·3 cm. thick; left ventricle 1·2 cm. thick). The remaining organs appeared normal.

After fixation the pleura was smooth, even, slightly more opaque than normal, and slaty-blue with blotches or small splashes of reddish purple. The cut surface of the lung was a dark brown-black.

On microscopical examination sections of the lung showed extensive acute bronchopneumonia and a fairly well-marked emphysema. There was no evidence of chronic inflammation and in particular *no fibrosis*. No thickening of the walls of the smaller bronchi or of the pulmonary arteries, as described by Boemke (1938), could be found. At least three kinds of pigment were present (fig. 4).

(i) Pigment enclosed in and filling phagocytic cells. A few of these cells were free in alveoli but the majority were found in collections or aggregates under the pleura and alongside pulmonary vessels. These aggregations distended the connective tissue in these areas but there was no good evidence of any increase in the surrounding connective tissue—i.e., there was definitely no increase in collagen fibrils, if there was any increase in reticulum fibrils it was very slight, and the cellular increase was entirely due to phagocytic cells. This pigment which would normally be taken as carbon, appeared opaque and black in transmitted light; it did not show any coloration after treatment with potassium ferrocyanide and hydrochloric acid (neither did the sample of rouge supplied). In incinerated sections it was readily seen by reflected light to be reddish brown; it dissolved with some difficulty but eventually almost entirely in strong acid.

Presumably this pigment was iron oxide. It constituted most of the pigment in the lung and was fairly evenly distributed with perhaps rather more in the upper lobes.

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(ii) A finely granular pigmentation of the elastic laminæ of the pulmonary arteries and of the elastic fibrils in the alveolar walls. This pigment appeared brownish black by transmitted light. It did not stain with potassium ferrocyanide and hydrochloric acid and attempts to colour it by *p*-dimethylamino-benzal-rhodanine (the spot test reagent for silver) were unsuccessful. In incinerated sections viewed by reflected light these granules were not identifiable with certainty but appeared to be represented by fine shining white lines. Sections which had been treated for some hours with 1/1000 KCN solution were compared with untreated duplicates (figs. 5–9).

This pigment had disappeared while the intracellular aggregates were unaltered. It is unlikely that the treatment would have removed any iron and the cyanide solution after use on several sections gave no reaction with ferrocyanide and HCl. We believe therefore that this pigment is silver, although the distribution is unlike that seen in our other cases of argyria. The latter were however produced by ingestion of silver nitrate many years before death, and not, as in this case, by inhalation of metallic silver continually up to a few weeks before death. Blaschko (1886) described a finely granular precipitate on elastic fibrils in the dermis in the neighbourhood of tiny particles of silver that had been driven through the epidermis of the fingers or hands of silver workers. This was the first demonstration of elastic fibrils in this region. He also noted that the distribution of the silver pigment in this condition differed from that found in the skin in argyria resulting from ingestion of silver nitrate. A good summary of this work and a reproduction of the illustration are given by Heffter and Heubner (1934).

(iii) Iron pigment stainable with ferrocyanide and HCl was present in small amounts in intra-alveolar phagocytes.

The only other organs available for section were the liver, spleen, thyroid and hilar lymph-node.

There was moderate central lobular congestion of the *liver* and in sections treated with ferrocyanide and HCl the chief abnormality was the presence of abundant blue granules in the liver cells especially towards their inner borders. Rarely the bile precanaliculi showed as dark blue lines and very few of the Kupffer cells were hypertrophied and stained blue. There was no portal fibrosis and no stainable iron in the portal tracts.

The reticulo-endothelial cells of the *splenic pulp* were closely packed and hypertrophied and contained masses of hæmosiderin. The malpighian bodies contained no pigment. There were some recent interstitial hæmorrhages between the malpighian bodies and pulp.

There were masses of pigment no. 1 in phagocytes in the medulla of a *hilar node*. The sinuses contained abundant phagocytes filled with hæmosiderin and there was a healed focus of tuberculosis whose scar tissue was stained diffusely blue by ferrocyanide and HCl.

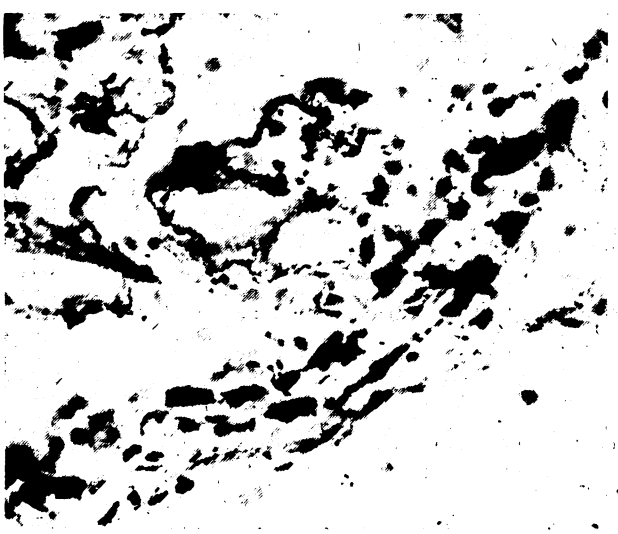

Fig. 9—Section of lung (× 450) showing fine dusting with silver in alveolar walls and arterioles, contrasting with the dark masses of iron pigment in phagocytes.

The large amounts of hæmosiderin in spleen, liver and lymph-nodes we believe to be derived from the rouge. Similar stainable pigment has been noted by several authors (e.g., Langguth 1895, Bohrod 1930) who have found most of the iron pigment in the lungs to be inert to ferrocyanide and HCl. Menkin et al. (1935, 1936) have demonstrated that inorganic iron can be converted in the animal body into a substance indistinguishable from hæmosiderin derived from hæmoglobin.

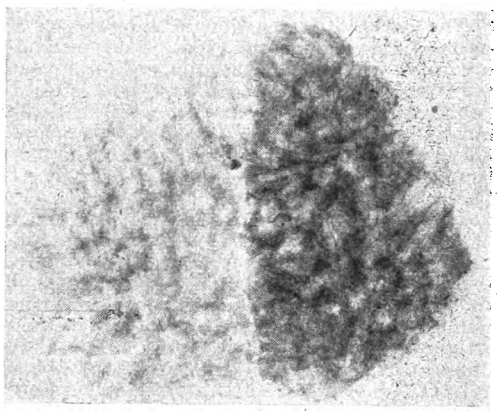

Fig. 10—Sponges : *Left.*—Radiogram of untreated sponge. *Right.*—Radiogram of sponge soaked in suspension of iron oxide.

Chemical examination of the lung showed that ash constituted 10·17% of the dry weight, and of this ash 72% was iron (reckoned as Fe_2O_3) and 6% was silver (as metal). No determination of the silica content was made, but incinerated and acid-treated sections showed only fine traces of doubly refractile material.

OPACITY OF IRON OXIDE AND SILVER TO X RAYS

It is well known, at least to radiologists, that metals and their salts placed in the path of X rays will throw shadows, the density of which varies with the atomic weight—i.e., the higher the atomic weight the denser the shadow. Although this fact is known, it has not often been considered in the interpretation of the chest films of workers who inhale radio-opaque dusts. Even when Collis suggested (Fawcitt 1943) to Thurstan Holland that hæmatite dust might be opaque to X rays, the latter, after agreeing that it was, said that he was convinced that the "main part of the shadowing (in the chest films of hæmatite miners) must be due to inflammatory thickening—particles of dust being merely the active cause of this. ..." Another elementary point about X-ray shadows seen in chest films is that the air in the lungs acts as a contrast medium against which the details of the opaque structures are shown up. In other words, if there were no air in the lungs there would be no lung detail seen in chest X-ray films.

Sponges in some respects resemble the lung tissue in that they consist of trabeculæ and air spaces. An X-ray picture of an untreated sponge resembles that of a normal lung. To determine whether iron oxide particles in sponges would throw X-ray shadows comparable with those seen in silver finishers and electric arc welders, we took a series of sponges and X rayed them. Then they were soaked in graded suspensions of iron oxide (ranging from 5 to 60 grains in a pint of water), the excess fluid was squeezed out, and they were again radiographed. Stippled shadows (fig. 10) appeared in the films of the rouge-containing sponges, varying in density with the concentration of iron oxide particles. Similar shadows were seen when sponges soaked in suspensions of French chalk were radiographed.

We have not been able to make similar experiments on the opacity of silver to X rays, but theoretically the shadows thrown by silver particles should be even more dense than those caused by iron oxide particles. The atomic weight of silver is 107·8, whereas that of iron is 56. The ash of the lungs of case 1 has been shown to contain 72% of iron and 6% of silver and it can be argued that at least some of the shadows seen on radiography are due to silver as well as to iron oxide. We think it likely that most of the shadowing is due to iron oxide rather than to silver because iron oxide is in the form of aggregates, whereas the silver is finely and widely distributed along the arteries and the alveolar walls. An

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aggregate of radio-opaque dust is more likely to throw a shadow than would particles of a more widely dispersed radio-opaque dust, even of a higher atomic weight. It is possible however that the silver particles might be responsible for some of the increase of linear markings of the film. The stippling or reticulation is, in all probability, caused by the aggregates of iron oxide dust.

SHORT REVIEW OF LITERATURE ON SIDEROSIS

The earliest description of siderosis of the lung was published by Zenker in 1866; he described the lungs of a woman who had been employed for 7 years in the preparation of blotting-paper by a now obsolete process of rubbing in powdered dry iron oxide (called "English red"), and also those of a man who had worked for 25 years at polishing mirrors with "English red" which is presumably similar to the rouge used by silver finishers. Cases were then described by Merkel (1869) and by Langguth (1895); the latter's patient had been a miner of red ironstone for 41 years. Three of these early cases certainly had pulmonary tuberculosis and the fourth probably had it; Langguth's case probably had silicosis as well. It is not surprising, therefore, that pulmonary fibrosis was a feature in all these cases although Merkel's showed only minimal amounts (see illustrations in Schmidtmann and Lubarsch 1930).

In 1923 Collis said that "X-ray photography has disclosed the presence of shadows suggestive of fibrosis of the lungs in hæmatite miners but the opacity of oxide of iron to X rays rather detracts from the significance of these findings." Letters passing between Collis and Thurstan Holland in 1919 show that they were even then considering that some X ray opacities in the lungs might be due directly to iron oxide and other dusts (Fawcitt 1943). Experimental work by Carleton (1927), by Haynes (1931) and by Naeslund (1938) showed that inhaled hæmatite dust did not produce any fibrosis of the lungs of guineapigs or rabbits.

Bohrod (1930) summarised the literature on siderosis of the lung and added two not altogether satisfactory fresh cases. Lawson et al. (1931) described a case of fibrosis of the lungs apparently due to silicosis in a iron miner, whilst Stewart and Faulds (1934) in an excellent paper described the sidero-silicosis occurring in West Cumberland hæmatite miners. Since then there have been several reports on the lungs of ironstone and hæmatite miners that have added little to our knowledge. Heim de Balsac and Feil (1935, 1939) stated that the X-ray findings in these workers are not infrequently much more evident than their clinical disability. Recently Fawcitt (1943) gave short notes on the history of iron-ore mining and of the clinical features of iron-ore workers; he illustrated the great variability of both the X ray and the clinical findings in workers in the Cumberland mines. There is of course no doubt that some hæmatite miners inhale the dust of free silica as well as iron oxide dust and that they develop silicosis and silico-tuberculosis.

Doig and McLaughlin (1936) were the first to draw attention to the X-ray changes in the lungs of electric arc welders, and suggested that, amongst other possibilities, the iron oxide particles might be opaque to X rays and produce the picture without the presence of pulmonary fibrosis or congestion; but they were unable to obtain post-mortem material to confirm this or their other suggestions.

Brailsford (1938) reported that he had found X-ray appearances of fibrosis in the lungs of most of a group of welders and considered that its cause was either the asbestos covering of the electrodes or the nitrous fumes generated by the arc. Killick (1938) also reported fine mottling in the X-ray films of the chests of 5 arc welders and stated that these had physical disabilities not found in 6 other welders, who had no visible mottling. Pozzi (1938) gave a rather depressing picture of the clinical course of arc welders but no factual data to substantiate his thesis.

Enzer and Sander (1938) examined 26 welders finding X-ray changes in 10 of them who had no symptoms and were apparently healthy; one of these men later died after an accident and they exhumed his embalmed body 16 months after death. This is the only recorded autopsy on an arc welder and it is noteworthy that Enzer and Sander could find no evidence of fibrosis in the lungs either on naked-eye examination or in histological sections, despite much pigmentation.

Britton and Walsh (1940) reviewed the literature on welders' lungs and reported the results of examination of 286 welders, all of whom had been exposed to the fumes for more than 5 years. They concluded that "changes in the chest films after many years' exposure to welding fumes may occur. These changes are not accompanied by disability." Harrold et al. (1940) exposed large numbers of animals to electric arc fumes, finding siderosis but no fibrotic changes or other lesions of a permanent nature ascribable to metallic fumes. Koelsch (1941) examined 40 welders and reported considerable X-ray changes in one of them. Nayer (1942) reported a case of a welder who showed multiple linear and nodular densities on radiography of the lungs and who also had an inflammatory lesion of the bronchus. Gardner and McCrum (1942) radiographed the lungs of 3 guineapigs that had been exposed to arc welding fumes for a long period and found that they could distinguish these from films of a normal animal's lungs, since the great number of fine particles of high molecular weight caused a diffuse shadow which gave the lung fields a very fine grainy appearance.

To the best of our knowledge no description of siderosis in a silver finisher or polisher has previously been published. The cases whose occupation and conditions of work most nearly approach those described in this paper are the earliest recorded examples of siderosis (Zenker) and the mirror polisher described by Boemke (1939). In all these it appears that the siderosis was due to rouge which may well have been impure.

DISCUSSION

X-ray examination of the chests of four silver finishers revealed the presence of stippled or reticulated shadows in each case, the picture resembling that found in welders, in hæmatite miners, and in other workers who inhale iron and iron oxide dust. The X-ray appearances of the lungs of electric arc welders were described by Doig and McLaughlin (1936) as a fine "stippling" and in some cases "nodulation" distributed more or less evenly over both lung fields. The X-ray picture is comparable in many respects with that later described by Hart and Aslett (1942) as "reticulation" in their studies of Welsh coalminers. In these miners it was found that the X-ray reticulation when correlated with the histological changes (Belt and Ferris 1942) was due to fibrosis and not to the presence of dust as such. In silver finishers and in welders the individual shadows appear to be related in size and distribution to the aggregates of iron oxide dust found in the peribronchial and periarterial lymph spaces. The density of the shadows is apparently proportional to the amount of iron oxide dust present and also to the atomic weight of iron. Cases of baritosis (Pendergrass 1938, and Preti and Talini 1938) caused by the inhalation of the dust of barytes and barium salts have somewhat denser shadows of a similar distribution in the chest films because the atomic weight of barium (137·4) is much higher than that of iron (56). In cases of both siderosis and baritosis there is little evidence that the presence of the dust per se in the lungs causes much if any disability, and certainly pure iron oxide does not set up a fibrotic reaction in the lung tissue. Admittedly the silver finisher who came to autopsy had emphysema of the lungs but it is not certain whether this condition was related to his occupation. Other radio-opaque dusts—e.g., French chalk, when inhaled into the lungs produce similar X-ray shadows with no apparent disability (Merewether 1934).

By contrast the X-ray shadows seen in cases of silicosis are in the main not due to the presence of opaque dust (atomic weight of silicon is 28), but probably to the amount of fibrotic tissue and congestion present in the lungs. We know of some cases in which there was fairly well-marked silicosis at autopsy but in which radiograms were normal during life. The shadows in silicosis become more dense as the lesions become older and particularly if calcium salts (atomic weight of calcium is 40·1) are deposited in them.

The X-ray changes seen in the early stages of pneumoconiosis of Welsh coalminers are called "reticulation" by Hart and Aslett (1942) and are regarded by them as a radiographic entity with an anatomical individuality. This is termed "dust reticulation" by Belt and Ferris (1942) and likened to innumerable small dust-ridden cobwebs linked up with each other. "They represent traps where dust-laden phagocytes have been brought

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to rest and transformed into fixed tissue phagocytes which then become knit together into a meshwork by the elaboration of reticulum fibres. These fibrils are argentophil ... and the condition is actually a form of fibrosis." In our silver finisher there are comparable X-ray changes and a similar anatomical distribution of dust and phagocytes, but no increase of reticular tissue.

It appears that when studying the X-ray appearances of "dusty lungs" or of the pneumoconioses two factors have to be taken into account: (1) the radio-opacity of the inhaled dust, and (2) the capacity of the dust to set up fibrotic or other pathological changes in the lungs —i.e., whether it is active or inert. Iron oxide in its pure form appears to be inert, but it is opaque to X rays. The X-ray appearances set up by an inert dust cannot be distinguished on the radiological evidence alone from the early changes caused by an active non-opaque dust. Finally the term "siderosis" has carried with it an implication that iron or its oxides causes fibrosis of the lungs; we think that a clear distinction should be made between siderosis and sidero-fibrosis.

SUMMARY

1. The results of the clinical and radiological examinations of 4 silver finishers who inhale the dusts of iron oxide and silver are discussed. In one case the gross and histological morbid anatomy and chemical analyses of the lungs are described.

2. The stippled or reticulated X-ray shadows of the lungs of these workers are cast by aggregations of iron oxide dust, opaque to X rays, in the peribronchial and periarterial lymph spaces. The presence of silver particles in the lungs does not materially affect this interpretation of the X-ray shadows.

3. No fibrotic changes (either collagenous or reticular) are set up in the lungs by the inhaled dust which consists mainly of pure iron oxide (rouge).

4. Little or no physical disability appears to be caused by the presence of iron oxide dust in the lungs, though in one case there was emphysema.

5. The particles of silver inhaled continually over 40 years produced intra-vitam staining of the elastic tissue in the arterial and alveolar walls. In 2 cases there was slight argyria of the sclerotics but in none of our 4 cases was the skin stained with silver.

6. In the interpretation of the X-ray films of the chests of workers in dusty occupations, consideration should be given both to the activity of the dusts in producing pathological changes and to the opacity of the dusts to X rays.

7. A worker who has inhaled radio-opaque dusts may have an X-ray picture of the lungs simulating early silicosis, miliary tuberculosis or other pathological condition and yet have no obvious physical disability.

Dr. E. Fretson Skinner and Dr. C. Gray Imrie kindly allowed us to report cases 1 and 4, and Dr. John Pemberton made the pathological investigation possible by remembering that case 1 had been radiographed 6½ years before admission to hospital.

We are also indebted to Mr. A. W. Collins for the photomicrographs (figs. 3–7) and to Dr. A. F. Foster-Carter and Dr. Kenneth Perry for fig. 8.

REFERENCES

Belt, T. H., Ferris, A. A. (1942) *Spec. Rep. Scr. med. Res. Coun., Lond.* no. 243, part I.
Blaschko, A. (1886) *Arch. mikr. Anat.* **27**, 651.
Boemke, F. (1939) *Ber. 1938 int. Kongr. Unfallmed. Berufskrankh.* vol. II, p. 1038.
Bohrod, M. (1930) *Arch. Path.* **10**, 179.
Britton, J. A., Walsh, E. L. (1940) *J. indust. Hyg.* **22**, 125.
Brailsford, J. F. (1938) *Brit. J. Radiol.* **11**, 393.
Carleton, H. M. (1927) *J. Hyg., Camb.* **16**, 227.
Collis, E. L. (1923) *Proc. R. Soc. Med.* **16**, 85.
Doig, A. T. McLaughlin, A. I. G. (1936) *Lancet*, i, 771.
Enzer, N., Sander, O. A. (1938) *J. industr. Hyg.* **20**, 333.
Fawcitt, R. (1943) *Brit. J. Radiol.* **16**, 323.
Gardner, L. U., McCrum, D. S. (1942) *J. industr. Hyg.* **24**, 173.
Harrold, G. C., Meek, S. F., McCord, C. P. (1940) *Ibid*, **22**, 347.
Hart, P. D'A., Aslett, E. A. (1942) *Spec. Rep. Scr. med. Res. Coun., Lond.* no. 243, part I.
Haynes, F. (1931) *J. Hyg., Camb.* **31**, 96.
Heffter, A., Heubner, W. (1934) Handbuch der experimentellen Pharmakologie, Berlin, vol. III, part 3, p. 2066.
Heim de Balsac, F., Feil, A. (1935) *Ann. Méd. lég.* **15**, 134; (1939) *Méd. Usine*, **4**, 395.
Killick, E. M. (1938) *Brit. J. Radiol.* **11**, 401.
Koelsch, F. (1941) *Arch. Gewerbepath. Gewerbehyg.* **10**, 519.
Langguth, F. (1895) *Dtsch. Arch. klin. Med.* **55**, 255.

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MITE-BORNE TYPHUS IN THE ANGLO-EGYPTIAN SUDAN

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SUDAN MEDICAL SERVICE

THE following case of mite-borne or "K" typhus is the first of this type to be recorded in Africa, and its clinical course differed in some respects from the typical Japanese river fever.

CASE-HISTORY

An English woman, aged 39, left England in 1938 and was in the Union of South Africa until she came with her husband to the Sudan. They travelled overland, arriving at their station, Abu Usher, on Aug. 19, 1943. She had had no illness since leaving England, and she fell ill with typhus in October. For 3 weeks before the onset of symptoms she had not been away from Abu Usher, which is 70 miles south of Khartoum, in the northern part of the gezira irrigated area, the great cotton-growing area of the Sudan. The common diseases here are relapsing fever, malaria, and bilharziasis. No case of clinical typhus had previously been reported in the gezira, and large numbers of Weil-Felix reactions, carried out on the blood of pyrexial cases in the gezira since the present case was diagnosed, have been persistently negative (OX 19, OXK, and OX2).

From about Oct. 7, 1943, the patient complained of headache of gradually increasing severity. It tended to come on in the afternoon and evening and could be relieved for a few hours by aspirin. The temperature was not recorded during this period but there was probably slight pyrexia. On Oct. 14 a papular rash appeared and the temperature was 99·2° F at 6 PM. The patient did not take to her bed until Oct. 16 when her afternoon temperature was 101° F. Headache was by this time severe, with pain in neck and shoulders like a stiff neck. Severe pain on movement of eyes, and congestion of conjunctivæ. There was pronounced depression. There was no glandular enlargement and the spleen could not be felt. Urine normal. I diagnosed her clinically as a case of typhus, and Dr. R. M. Humphreys, senior physician of the Khartoum Civil Hospital, confirmed by opinion. We have both had experience of typhus in Persia.

During the next six days her condition got worse. The temperature rose to 103° F, being a degree or so lower in the mornings than in the afternoons. Headache was severe and intractable. Patient had, in the past, suffered from occasional severe attacks of migraine, but described the headache as being much worse than any she had experienced in these attacks. There was severe prostration, and insomnia. Later she was largely amnesic for this period. On Oct. 23 there was slight improvement, continued until Oct. 27 when the temperature became normal and showed no further rise. Convalescence thereafter was uninterrupted but slow.

Rash.—The rash appeared as a few papules on the abdomen and back on Oct. 14. By Oct. 16 these had increased considerably in number. No rash ever appeared on arms, legs, neck, or face. No primary eschar was discovered, but it is possible that this was missed since she was suffering badly from sandfly bites on the legs at the time. On Oct. 18 the rash began to fade, and by Oct. 21 there was only apparent a faint subcuticular mottling on the back, and some general discoloration of the abdomen which lasted for about ten days longer.

Continued from previous column

Lawson, G. B., Jackson, W. P., Gardner, J. E. (1931) *J. Amer. med. Ass.* **96**, 1129.
Lorenz, E., Menkin, V. (1936) *Arch. Path.* **22**, 82.
Menkin, V. (1935) *Ibid*, **19**, 53.
— Talmadge, S. M. (1935) *Ibid*, **19**, 61.
Merewether, E. R. A. (1934) *Rep. Chief Insp. Fact., Lond.* p. 65.
Merkel, (1869) *Dtsch. Arch. klin. Med.* **6**, 616, quoted by Schmidtmann and Lubarsch.
Naeslund, C. (1938) *J. industr. Hyg.* **20**, 435; (1940) *Ibid*, **22**, 1.
Nayer, H. R. (1942) *J. Amer. med. Ass.* **119**, 1500.
Pendergrass, E. P. (1938) in Lanza's, Silicosis and Asbestosis, London, pp. 137 and 139.
Pozzi, N. (1938) *Arch. Mal. profess.* **1**, 389.
Preti, L., Talini, P. C. (1939) *Ber. 1938 int. Kongr. Unfallmed. Berufskrankh*, vol. II, p. 963.
Sander, O. A. (1939) *Industr. Med.* **8**, 177.
Schmidtmann, M., Lubarsch, O. (1930) in Henke and Lubarsch's Handbuch der speziellen pathologischen Anatomie und Histologie, Berlin, vol. III, part 2, p. 117.
Stewart, M. J., Faulds, J. S. (1934) *J. Path. Bact.* **39**, 233.
Zenker, F. A. (1866–67) *Dtsch. Arch. klin. Med.* **2**, 116, quoted by Schmidtmann and Lubarsch.

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Laboratory investigations.—No malaria parasites were found in blood slides examined on several occasions. Specimens of blood and fæces were sent to the Stack Medical Research Laboratories on Oct. 18; reports were as follows:

Blood-culture, sterile.

Widal reaction.—The standard procedure in the Stack Laboratories is to use living suspensions of 18-hour broth cultures in all cases. The cultures are diluted to 450 millions per c.cm. as in the standard Dreyer's technique. The tubes are incubated in a water-bath for 4 hours at 52° C, then removed and left on the bench till next morning (18 hours), when the readings are recorded. Blood from cases of epidemic (louse-borne) typhus imported from Egypt has given consistently positive agglutination tests with OX 19 and negative with OXK and OX 2. In the present case the results were: Typhoid "H" 1 in 500; typhoid "O" 1 in 50; para A, para B, and melitensis negative. The high "H" titre was in all probability due to a recent TAB endotoxoid inoculation and hence of no significance.

Weil-Felix reaction.—HX2, 1 in 50; OX2, negative; OX19, 1 in 50; OXK, 1 in 2500.

Fæces: no pathogenic organism isolated.

Urine: sterile.

COMMENT

The clinical features and laboratory findings leave little doubt that the case was one of the typhus group.

The high OXK agglutination titre is usually regarded as characteristic of the Far Eastern subgroup of rickettsial infections transmitted by mites, but this subgroup appears to be unknown in Africa. The possibility remains that the case was an atypical infection of one of the African endemic types: but with the exception of one probable case of tick typhus reported in the Southern Sudan, Equatoria Province,[1] neither murine (rat-flea-borne) nor tick typhus has ever been encountered in the Sudan. Epidemic typhus (louse-borne), with the exception of a few cases imported from Egypt in 1943 which were confined to the frontier district of Wadi Halfa, is also unknown in the Sudan.

The exact type of infection in this case therefore remains unknown.

Preliminary Communications

TRANSMISSION OF ARSENOTHERAPY JAUNDICE BY BLOOD: FAILURE WITH FÆCES AND NASO-PHARYNGEAL WASHINGS

DURING the present war there has been a very high incidence of jaundice associated with arsenotherapy in certain venereal disease clinics in England. Attempts to transmit the disease to animals by inoculation of blood, nasal washings, fæces, and urine have been unsuccessful. In order therefore to obtain information on the ætiology of this condition, blood and fæces from two cases of so-called arsenotherapy jaundice have been inoculated into human volunteers.

Case 1 was a soldier attending a military VD clinic in which formerly there had been a high incidence of jaundice, which, however, had dropped to a low level in the months immediately before the patient became ill. Jaundice developed in this man during the 14th week of his treatment, after 12 injections of neoarsphenamine and 6 of 'Thiostab.' Blood was collected 16 days after his first sign or symptom (which was a punctate erythematous rash), and 24 hours after slight jaundice of the sclerotics had been observed.

The serum from this man, which was Wassermann-negative, was injected subcutaneously in amounts of 0·25–1·0 ml. into ten volunteers (group A), seven of whom developed symptoms after 35–60 days, and jaundice after 42–70 days (approximately). Repeated attempts to transmit the condition from the positive takes in group A by means of nasopharyngeal washings and material collected on tonsillar swabs during the preicteric and icteric stages failed to produce jaundice in seventeen volunteers (group B).

Case 2 was a man who had infective hepatitis in December, 1943. Syphilis was diagnosed on July 20, 1944. He was treated in a second Army clinic, in which the incidence of jaundice, once as high as 50%, had recently been reduced to approximately 10%. The patient was given 28 daily intravenous injections of 'Neohalarsine' and became jaundiced 110 days after the first injection and 82 days after the last injection. Blood and fæces were obtained 3 days after his first symptom, and 24 hours after the jaundice was observed.

After 10 days' storage at −20° C and 3 days at 0° C, 0·25 ml. of this patient's serum (sigma test negative) was inoculated subcutaneously into each of nine volunteers (group C), five of whom developed jaundice 45–80 days later.

The fæces were made up as a 20% suspension in broth, and treated with 10% ether overnight at 0° C. Twenty volunteers (group D) drank 5·0–10·0 ml. of the suspension in orange juice after evaporation of the ether. Six of the twenty volunteers also had 5·0 ml. of the suspension sprayed into the nose and pharynx. None of these volunteers became jaundiced. Later, 7–8 weeks after the original inoculation, fifteen of group D drank 5·0–8–0 ml. of untreated suspensions of fæces collected in the preicteric and icteric stages from patients in group A. None of them became jaundiced.

Medical Research Council: Jaundice Investigation.
F. O. MACCALLUM, MD TORONTO.

1. Horgan, E. S. Report of the Sudan Medical Service, 1941.

Reviews of Books

Health and Social Welfare: 1944–1945

Advisory Editor: Lord Horder. (Todd Publishing Co. Pp. 334. 21*s.*)

THIS new reference book aims at providing a directory of departments, organisations, and individuals active in health and welfare work, and a review of varying shades of opinion upon topical health and welfare problems. Lord Horder has acted as advisory editor, and has assembled a catholic selection of opinion. Sir William Beveridge, Dr. Edith Summerskill, Dr. Charles Hill, and Mr. Somerville Hastings have all contributed. Specialised articles cover among other things family allowances, industrial welfare, and rehabilitation. Recent reports by Government and other committees are reviewed; and the different departments, and an exhaustive array of health and welfare organisations, state their purposes and policies. A bibliography covers books and periodicals; films on subjects of medical importance are listed and their distributors identified. Tables of vital statistics are provided, and finally an attempt is made to provide a short "Who's Who in Health and Social Welfare."

This is an ambitious project to inaugurate, particularly in war-time, when there are so many other demands upon the time of contributors, and when delays in printing and publication are unavoidable. A year-book often needs revision almost before it appears. Internal evidence suggests that most of the material in this volume had been collected by the early part of 1944, and it is inevitable that much is now out-dated. Nevertheless, it is a work of reference that all active participants in health and welfare work should find valuable, and future editions are likely to become a necessary part of any medical library of reference.

Advances in Protein Chemistry

(1st. ed.) Vol. 1. M. L. ANSON, JOHN T. EDSALL. (Academic Press, New York. Pp. 341. $5.50.)

IN this volume of nine articles, eight are by American, one by an English author. Each has dealt with a particular aspect of protein chemistry, and a chapter has been devoted to lipoproteins, structural proteins of cells and tissues, the purification and properties of certain hormones, nucleoproteins, the protein of skeletal muscle, and so on. Those who had no taste for Ministry of Food sausages (now modified) may appreciate the article on soya-bean protein, but in general nutritional aspects of the subject have been reserved for volume two, which should appear this year.

Such articles as these make rather dull reading for the man who is not specialising in the same subject, but the best are very good, giving a critical account of published work and a clear statement of opinion. There are some good photographs, particularly of the minute structure of sperm tails as revealed by the electron microscope. The volume is perhaps one for chemists and biochemists rather than physicians, but these chemists must be watched: biochemistry has become the key which will unlock the secrets of botany, physiology, and ultimately of medicine itself.

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THE LANCET

LONDON: SATURDAY, MARCH 17, 1945

Whiter Bread

WITH the war in Europe drawing towards its close it was inevitable that the composition of the national loaf should be brought again under discussion, although the food position in Europe, and indeed in the whole world, does not appear to warrant any relaxation. So after an interlude of 3 years the old controversy—white, off-white, or wholemeal—has been raised again in the House of Lords, with many of the old arguments and protagonists, but some new evidence.

The national loaf, made from flour of 85% extraction, was instituted in 1942 to save shipping space, and there was almost complete unanimity among the experts that it was also nutritionally preferable to the previous white loaf of 70–75% extraction. So it remained until last autumn, when the Ministry of Food announced that the national loaf would in future be whiter and made from flour of 82½% extraction. This was done on Oct. 1, and in January they announced that a further reduction had been made to 80%. In the House of Lords debate on Feb. 28 (reported last week) Lord TEVIOT moved that the standard of 1942—i.e., 85% extraction—should be regarded as the minimum compatible with the maintenance of the health of the people, and that if the extraction-rate has been reduced below that standard it shall forthwith be restored. Lord HORDER, in support of the motion, spoke strongly of the value from the medical standpoint of the flour of 85% extraction, recalling that when, in March, 1942, the introduction of this bread was announced, he had said that no single step which the Government could take was as likely as this to raise the level of the country's nutrition. Three years' experience, he said, had proved him right. Lord WOOLTON explained that the first change was made as the result of a visit he paid to the Ministry of Food research station, where Sir JACK DRUMMOND and Mr. T. MORAN, D SC, had devised a process for separating the scutellum of the wheat germ and bringing it into the flour; in this way an 82½% extraction flour could be made as rich in vitamin B as one of 85% extraction. His scientific advisers were satisfied that the reduction to 82½% could safely be made without interfering with the nation's health. Since then, he said, it had been suggested that we could go lower and still get the advantages from a health point of view with the consumption of less bran. The experiment was being tried. The Ministry had not got the figures yet to show whether they were right or wrong. If they found they were wrong they would say so and go back; and he undertook that the Government would not go *below* 80% until they were satisfied that it would not be detrimental from the nutritional point of view. Lord CRANBORNE remarked that this would not apply to imported flour, mixed with the home-produced. Lord TEVIOT withdrew his motion, but expressed himself as far from satisfied.

The figure of 85% for the extraction of national flour was chosen in 1942 because below this point the content of some B vitamins was found to fall rapidly, while above it the colour rapidly darkened. The only substance in such a high-extraction flour known to be deleterious is phytic acid, and this can be and has been neutralised by adding calcium. In spite of new milling methods, the investigations of the Ministry of Food's own Cereals Research Station have demonstrated a 10% fall in vitamin B_1 and a 25% fall in riboflavine in the change from 85 to 82½% extraction,[1] though nicotinic acid has risen 6%. The analyses of 80% flours are not yet complete—specimens from some 300 mills have to be dealt with—but they seem likely to contain only three-fifths as much riboflavine as the 85% flour.[2] These are losses of known nutritive factors; but there may be losses of other, unknown, nutrients. Even ignoring such possibilities, it seems that the hopes of Lord WOOLTON and his advisers, that the extraction-rate could be reduced without loss in vitamin content, are not being fulfilled. If so, the Government should at once retrace their steps. We see the good standard of health that the nation has enjoyed during the war; we cannot say exactly to which of many factors this has been due; we suspect that the national loaf has played its part; and we do not want to lose any of the ground that has been won.

The advocates of a return to white flour make the most of the popular prejudice in its favour which undoubtedly existed in the past but has been to some extent modified by the experience that a palatable loaf can be made from a flour of 85% extraction. To make their argument nutritionally sound they advocate the enrichment of white flour with some of the vitamins in which it has been demonstrated to be deficient, and point out the value of the milling offals for feeding poultry, pigs, and cattle to provide more meat, milk, and eggs for human consumption. This policy of fortification has been adopted in the United States; but, although it has satisfied the millers and the manufacturers of synthetic vitamins, the product has not obtained the approval of all the nutritional experts,[3] and is unlikely ever to appeal to those who have made a biological study of nutrition. Thus, MITCHELL and his colleagues[4] were convinced that white bread enriched with vitamin B_1, nicotinic acid, riboflavine, and iron had a nutritive value inferior to that of whole-wheat bread, and that an addition of 6% skim-milk solids was necessary before the fortified loaf was equal to the wholemeal loaf. Nevertheless, the American Medical Association and Public Health Association are pressing[5] for the perpetuation of the war-time fortification, because of the value of the extra vitamins. The argument which claims that the offals from the milling trade are necessary for feeding stock will easily be disposed of when the war is over and the shipping situation no longer sets the limit to the amount of wheat which can be imported. Stock prefer whole wheat to millers' offals, and there is no compelling reason why the foods for cattle must pass through

1. *Nature, Lond.* 1944, **154**, 788.
2. Ministry of Food Cereals Research Station, St. Albans, 1944. High Vitamin Flour (Pamphlet), London.
3. Lepkovsky, S. *Physiol. Rev.* 1944, **24**, 239.
4. Mitchell, H. H., Hamilton, T. S., Shields, J. B. *J. Nutrit.* 1943, **25**, 585.
5. Editorial, *J. Amer. Med. Ass.* Jan. 20, 1945, p. 160.

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the millers' hands if this is not in the interests of the community.

After the war, if the public wants white bread it will no doubt get it; but it should be as a luxury, as fancy bread fortified as completely as possible, and sold at a higher price than the bread of the people. A national loaf of sufficiently high extraction to contain all its own inherent nutrients should be available at a price to suit the poor, in whose diet bread plays so preponderating a part, and the full force of propaganda should publicise its nutritional attractions. As Lord HORDER urged in the House of Lords, there should be a specification for our post-war flours. It will have to be changed and added to as knowledge grows, but already it would be possible to lay down minimum standards for vitamin B_1, riboflavine, nicotinic acid, calcium, and iron. It would then be open to the millers to compete for the public favour, provided they kept to the standards, with browner breads containing their own vitamins, or whiter breads fortified with additional ones. In countries whose economy is so planned that there is a large surplus of skim milk it could be used for fortification, but that is hardly practicable here.

So much for the future. For the present, while shipping difficulties continue, we must make our wheat go as far as we can. The Ministry of Food should come out in the open, tell us clearly on what evidence changes are made, and clear up any outstanding suspicions that considerations of profit are outweighing those of nutrition.

Iron Oxide in the Lung

THE first description of radiological changes in the lungs of electric-arc welders was given by DOIG and MCLAUGHLIN[1] in 1936. Of 16 apparently healthy young welders 6 showed generalised fine mottling over both lung fields, and none had a radiographically normal chest. The investigators suggested that iron-oxide particles might be opaque to X rays and produce the picture in the absence of either fibrosis or congestion. Two years later ENZER and SANDER[2] in the United States recorded the only necropsy so far reported, and from chemical analysis of the lungs concluded that the radiological opacities were due to iron oxide. HARDING,[3] by injecting iron oxide in the form of rouge into the trachea of rats, produced X-ray reticulation in their lungs, without fibrosis, and MCLAUGHLIN has shown that suspensions of iron oxide in sponges will cast an X-ray shadow comparable with those seen in the chest. The present war has brought an immense development of electric-arc welding, particularly in the building of ships and tanks. In consequence many men with these X-ray changes are now being seen, and further accounts of them have been given by SANDER,[4] JONES and LOCKHART,[5] and GROH.[6] There seems little doubt that iron oxide is the cause, and that it can even produce, in the radiogram, nodulation almost indistinguishable from silicotic nodulation.

COOKE[7] in 1930, reporting pulmonary disease in a boiler-scaler of 35 who developed shortness of breath after 9½ years' employment, attributed the changes to flue dust rather than boiler scale, which contained less siliceous matter. Since then further cases of boiler-scalers showing radiological abnormalities in the lungs have been reported by others.[8] Last year HARDING, MCRAE TOD, and MCLAUGHLIN[9] described the case of a boiler-scaler.

> The man, aged 61, had never done any other work since the age of 14. In April, 1938, he had dyspnœa and cough, and X rays showed nodulation throughout both lung fields. In December, 1943, he died with a carcinoma in his right upper-lobe bronchus; and sections made from his lung showed typical solid, collagenous, silicotic nodules, pigmented like those in the lungs of coal-miners. The lungs yielded 5·1% of ash. Iron formed 0·6% and silica 0·17% of the dry weight of the lungs. Samples of boiler scale from the ships' boilers scaled by this man contained 10·1% of iron and 8·6% total silica; while samples of the flue dust contained 48·3% of iron and 6·1% total silica.

It seems therefore that in boiler-scalers the radiographic changes are due partly to iron oxide and partly to silica.

In this issue MCLAUGHLIN, GROUT, BARRIE, and HARDING give a fascinating account of a third occupational disease in which iron oxide is inhaled and produces changes in the X-ray picture.[10] It appears that silver-finishers polish silver and plate with rouge, and that many have been found to have X-ray reticulation. When one such man died sections of his lung showed collections of particles in the peribronchial and periarterial lymph-spaces which chemical analysis of the lung suggested were iron oxide. The histological sections obtained form an interesting contrast with those from lungs of men with argyria, described by HARKER and HUNTER,[11] in whom there was a deposit of silver in the arteries of all the organs of the body. The silver-polisher, who showed no argyria, had a far greater deposit in the lungs, but the radiological appearances, though partly due to silver, seem to have been mainly due to iron oxide.

It has always been difficult to assess disability in men showing this type of diffuse shadow in radiograms of the chest, and this difficulty is responsible for the complexity of the present silicosis legislation. Clearly, however, boiler-scalers should be covered by these schemes under the Workmen's Compensation Act. The principal associated symptom is shortness of breath, and the only method of measuring it is by estimating the vital capacity—a somewhat unsatisfactory criterion, since it is influenced by the temperament of the patient and his ability to coöperate. There is a tendency to assume that because iron oxide does not cause fibrosis in the lung it does not cause disability; but this does not necessarily follow. The lung is an elastic organ, and if its lymph-spaces are plugged with solid iron-oxide dust its elasticity may well be impaired, with a corresponding reduction of vital capacity. It will, however, take a generation to establish such impairment beyond doubt; and in that time methods of prevention should have stopped all harmful dust getting into the lung. We trust it will not be long before exhaust ventilation in factories is taken as much for granted as are household drains in the cities of today.

1. Doig, A. T., McLaughlin, A. I. G. *Lancet*, 1936, i, 771.
2. Enzer, N., Sander, O. A. *J. industr. Hyg.* 1938, **20**, 333.
3. Harding, H. E. *Brit. J. industr. Med.* 1945. In the press.
4. Sander, O. A. *J. industr. Hyg.* 1944, **26**, 79.
5. Jones, T. R., Lockhart, J. A. *Texas St. J. Med.* 1944, **39**, 532.
6. Groh, J. A. *Industr. Med.* 1944, **13**, 598.
7. Cooke, W. E. *Brit. med. J.* 1930, ii, 816.
8. Williams, H. M. 19th *Rep. Welsh nat. Mem. Ass.* 1931, p. 153; Todd, P. G., Rice, D. *Lancet*, 1944, i, 309; Dunner, L. *Brit. J. Radiol.* 1943, **16**, 287; Dunner, L., Hermon, R. *Ibid*, 1944, **17**, 355.
9. Harding, H. E., Tod, D. L. McR., McLaughlin, A. I. G. *Brit. J. industr. Med.* 1944, **1**, 247.
10. Their article was received for publication on Jan. 19, 1944.
11. Harker, J. M., Hunter, D. *Brit. J. Derm.* 1935, **47**, 441.

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Hormonal Stimulation of Lactation

THE discovery by STRICKER and GRUETER[1] in 1928 of the lactogenic (lactation-initiating) activity of anterior-pituitary extracts inaugurated a new era in lactational physiology. An entirely new field was thus opened up which research workers were quick to explore, with the result that prolactin (anterior-pituitary lactogenic hormone), regarded by most authorities as the anterior-pituitary hormone specifically responsible for the initiation of lactation, is now available in what appears to be the pure state for laboratory studies—the first anterior-lobe protein hormone to be so isolated. Active preparations of partially purified prolactin have been available since the middle '30s, and partly because of preliminary reports of successful stimulation of established lactation in animals with crude anterior-pituitary extracts, hopes were entertained that prolactin preparations (the purer the better) might prove useful for the treatment of deficient lactation in the puerperium. No doubt because of difficulties familiar to every clinician responsible for the management of human lactation, comparatively few well-controlled clinical trials of prolactin have been carried out, but such studies as have been reported have been far from uniformly successful. Perhaps the most promising results were those of KENNY and KING,[2] but these apart, a survey of the published work leads to the disappointing conclusion that prolactin therapy offers little guarantee of certainty in the treatment of human lactational deficiencies.

The studies of FOLLEY and YOUNG[3] on the galactopoietic (lactation-stimulating) activities of a series of ox anterior-pituitary extracts in cows go far towards explaining the comparative failure of prolactin as a galactopoietic agent. These workers found that galactopoietic potency was more closely related to glycotropic (anti-insulin) activity than to prolactin content as assayed by the convenient and universally used pigeon crop-gland test, and their results led them to the conclusion that galactopoietic activity is due to a complex of anterior-pituitary hormones of which prolactin is only one of a number of coöperating partners. It is therefore not surprising that commercial prolactin preparations, standardised solely for prolactin content by the pigeon test, have not always proved as efficacious as hoped for correcting lactational deficiencies in women. As FOLLEY and YOUNG[4] have pointed out, the puerperal woman may with reason be regarded as physiologically more comparable with the lactating cow than with a creature so remote in the phylogenetic scale as the pigeon; so a convenient method, based on the stimulation of lactation in a mammal, for the assay of the galactopoietic potency of anterior-pituitary extracts intended for clinical use, is urgently needed. There are obvious possibilities for the clinical use of crude saline extracts of ox anterior lobe, such as were found by FOLLEY and YOUNG to be more active, as tested on lactating cows, than purified prolactin preparations, but the use of such extracts might be attended by diabetogenic effects or severe local reactions; so clinical trials along these lines would need careful control.

Recent experimental studies in the field of lactational endocrinology have suggested other ways of stimulating human lactation. Œstrogen, for long successfully used for the prevention or suppression of undesired lactation, can also, it appears, act as a lactogenic and galactopoietic agent. FOLLEY[5] showed that the administration of œstrogen to lactating cows would, in favourable circumstances, exert a protracted galactopoietic effect by increasing the concentration of solids in the milk with no diminution of yield. Later, this general principle was strikingly confirmed by the demonstration[6] in the same laboratory that virgin goats could be brought into lactation merely by treatment with synthetic œstrogen. Here, of course, the œstrogen is involved in two distinct processes—growth of the mammary gland, and the initiation of lactation. Papers in a recent number of the *Journal of Endocrinology*[7] describe the extension of this work, with some prospect of ultimate application on a practical scale, to heifers and cows. These interesting lactogenic and galactopoietic effects of œstrogenic hormone almost certainly involve activation of the anterior pituitary, and there is some evidence that an important factor determining whether the response is stimulatory or inhibitory is the level of œstrogen attained in the body fluids. In general, stimulation requires lower doses than inhibition, but a number of factors are probably involved. So far these findings do not seem to have been applied to puerperal women, but in view of the striking results obtained with farm animals, clinical investigations along these lines seem worth while.

Yet another hormonal agent for the stimulation of lactation has been revealed by the studies of GRAHAM,[8] and others who have confirmed and extended his conclusions, which have shown conclusively that thyroid hormone has a well-marked galactopoietic effect in lactating cows. Happily, practical difficulties which precluded the large-scale application of this work have largely been solved by the discovery of LUDWIG and von MUTZENBECHER,[9] following up earlier work, that by iodination of tyrosine-rich proteins such as casein, iodo-proteins exhibiting the biological activity of thyroid hormone are formed. Since iodo-casein can easily be made from materials which are plentiful it is obvious that wide possibilities are opened up for the use of this material, fed to cows, for increasing the milk-supply. Preliminary reports of successful stimulation of lactation in cows by feeding iodo-casein have been made by REINEKE and TURNER,[10] and BLAXTER.[11] The clinical use of this substance for purposes for which synthetic thyroxine or dried thyroid gland have hitherto been used is worth investigating, and although the available clinical reports on the use of thyroid preparations for correcting lactational deficiencies are not very encouraging; it would be desirable to reinvestigate the problem using iodo-casein. With thyroid hor-

1. Stricker, P., Grueter, F. *C.R. Soc. Biol. Paris*, 1928, **99**, 1978.
2. Kenny, M., King, E. *Lancet*, 1939, ii, 828.
3. Folley, S. J., Young, F. G. *Proc. roy. Soc.* B. 1938, **126**, 45; *Biochem. J.* 1939, **33**, 192; *J. Endocrinol.* 1940, **2**, 226.
4. Folley, S. J., Young, F. G. *Lancet*, 1941, i, 380.
5. Folley, S. J. *Biochem. J.* 1936, **30**, 2262; Folley, S. J., Scott Watson, H. M., Bottomley, A. C. *J. Dairy Res.* 1941, **12**, 1.
6. Folley, S. J., Scott Watson, H. M., Bottomley, A. C. *Ibid*, 1941, **12**, 241.
7. *J. Endocrinol.* 1944, **4**, no. 1.
8. Graham, W. R. *J. Nutrit.* 1934, **7**, 407.
9. Ludwig, V., von Mutzenbecher, P. *Hoppe-Seyl. Z.* 1939, **258**, 195.
10. Reineke, E. P., Turner, C. W. *Res. Bull. Mo. agric. Exp. Sta.* 1942, No. 355.
11. Blaxter, K. L. *Nature, Lond.* 1943, **152**, 751.

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mone, as with œstrogen, overdosage will lead to responses very different from those intended, and though the amount per kilogramme found suitable for cows may serve as a rough guide, the dosage factor will need careful investigation by those conducting clinical trials.

Annotations

A NATIONAL COLLECTION

AT the request of the War Office Dr. Joan Ross has arranged an exhibition of the specimens, drawings, and photographs which form the nucleus of the new collection illustrating war surgery designed to replace that lost through damage to the Royal College of Surgeons. The material has been collected from various sources—from civilian casualties, and from the fighting Services in the Low Countries and Italy. Much of the material was collected at the front by Dr. Ross in person. The specimens and illustrations are representative of all types of war injury. Drawings by Mrs. C. G. Ehrenborg (Cecil Trew) are the results of a tour with the 21st Army Group in Holland, and accurately record important details of colour (for example in asphyxia), as well as illustrating points in technique and treatment.

Serial coloured photographs, by Mr. P. G. Hennell, taken during the progress of treatment, are particularly striking and informative. Among these a series illustrating decortication of the lung for fibropurulent pleurisy or organising hæmatoma is outstanding. There is also an interesting series illustrating penicillin irrigation of flesh wounds. Later, this method was superseded in Holland by penicillin intramuscular drip, but now opinion is veering again towards local treatment. Other good exhibits demonstrate the pathology of gas-gangrene, differences in frostbite sustained by members of the RAF when barehanded and when gloved, blast lesions, and injuries caused by mines—which last, unfortunately, may continue to be seen long after hostilities cease. It seems that the Italian peasants already have a precautionary measure: when setting out to till a field they send their oldest donkey on ahead. One set of drawings shows jeep ambulances, Dakota aircraft fitted with stretchers, and other methods of transport for the wounded. Some remarkable examples of multiple injuries are illustrated; the survivors of these would certainly have died before surgery reached its present efficiency.

The exhibition on view at the Royal Society of Medicine, has had great interest not only for those engaged in treatment but for those concerned with research. Much that has been contributed will provide material for study for many years to come.

PENICILLIN IN ANTHRAX

IN his early work on penicillin in 1929, Fleming observed that the organism of anthrax was inhibited by this substance, and Murphy and colleagues[1] have now employed it successfully in human anthrax. Their three cases were all of the non-bacteræmic cutaneous type, and confirmed bacteriologically.

The first, a white woman wool-worker, did not pay any particular attention to her lesion until days after its appearance, when she was admitted to hospital. The lesion was then about 2 cm. across and caused swelling from the wrist to the antecubital space. Penicillin was given in a continuous intravenous infusion for five hours, and she received 25,000 units. By this time the erythema and induration about the lesion had stopped spreading. The intravenous infusion was restarted and continued for twenty-four hours, a total of 175,000 units being given. Then by the intramuscular route the patient received 12,500 units two-hourly for 48 hours. The course of therapy lasted a little over three days, by which time she had received 475,000 units of penicillin, of which 300,000 was intramuscular. The temperature became normal at the end of eighteen hours of therapy. The pain disappeared almost immediately, and at the end of four days the erythema and induration had disappeared, while the vesicles had become dry. She was discharged from hospital on the ninth day.

The next patient was a woman with a typical lesion on her face, 2 cm. in diameter. For fifty-three hours she was given a continuous intravenous infusion of penicillin, receiving 225,000 units in this manner; then non-anthrax developments necessitated a change to the intramuscular route, by which 8000 units was given. The penicillin therapy lasted three days. Twelve hours after its commencement the erythema and serous discharge had disappeared. At the end of seventy-two hours of treatment all œdema had gone, and the lesion was quite dry and appeared innocuous. Smears and cultures taken on the second day of the disease and onwards were negative. She left hospital on the ninth day.

A third woman had a small pimple on the ulnar aspect of her left forearm. She received a dose of staphylococcus vaccine, but a smear next day showed *B. anthracis*. The lesion was 2 cm. in diameter. By continuous intravenous infusion 100,000 units of penicillin was administered, and when 40,000 units had been given erythema and induration of the lesion had decreased. After 100,000 units the lesion looked dry and the erythema had disappeared. Smear and culture on the fourth day was negative, and the patient was discharged from hospital on the tenth day.

Murphy and his colleagues conclude that "in anthrax a total of 100,000 units of penicillin is certainly the minimum effective dose, and a total of 200,000 to 400,000 given at the rate of 100,000 units per day should serve to evoke a satisfactory response in the average uncomplicated case of cutaneous anthrax." When penicillin is available it seems to be the drug of choice in this disease.

DECORTICATION IN HÆMOTHORAX

FOR a simple hæmothorax the principles of treatment have been clearly laid down. The blood should be removed early and completely by aspiration, which must be repeated until the chest is dry. This will encourage re-expansion of the lung, and a full return of function can be hastened by special inspiratory breathing exercises, whose importance can scarcely be overstated. There is, however, the more complicated form of hæmothorax in which clotted blood or fibrin is found and in which the danger of infection is considerable. Conservative treatment in this type of case is but rarely followed by full expansion of the underlying lung. Clotting or delay in aspiration produces an encysted collection of fluid, clot, and fibrin, with firm fibrous walls which hinder expansion of the lung and restrict the movement of the chest. Even if infection is not added to the clotted or encysted hæmothorax, the chances of complete recovery are slight, and the usual sequel is an immobile area of chest with flattening, deformity, and deficient ventilation. The term "frozen chest" gives a graphic idea of the disability encountered. Operations for removal of clot and fibrin and of drainage for infected hæmothoraces often fail to bring about rapid recovery. With skilful surgery a large or even total pyothorax may eventually leave a well-functioning lung, if the case is carefully observed and subjected to continuous physiotherapy in the form of expansion exercises; but the process will probably take months. The same applies, to a lesser extent, where there is retained clot and fibrin.

The question is how best to deal with the fibrous tissue that speedily becomes laid down in the walls of

1. Murphy, F. D., La Boccetta, A. C., Lockwood, J. S. *J. Amer. med. Ass.* 1944, **126**, 948.

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the hæmothorax cavity. The parietal thickening is always greatly in excess of the visceral resistant cover, and, though this latter is generally regarded as the more important, Price Thomas and Cleland, opening our present issue, suggest that removal of the visceral layer without clearing the parietal thickening is not likely to give a perfect result. If these rigid layers are removed the lung and chest wall can come together and regain their normal function. The use of chemicals as solvents for fibrous tissue has not met with much success; the hypochlorite solutions which were at one time favoured in the treatment of chronic pleural infection are now only occasionally used. Claims for azochloramide as a fibrous-tissue solvent are being tentatively advanced, but determined attack can only come from active surgery. The planned operation which is covered by the term decortication is an elaboration of the procedure originally suggested by Delorme in 1896 for the treatment of chronic empyemas. Though the operation was occasionally practised before this war, it is only since chronic hæmothorax has become recognised as a common result of battle injuries that it has been revived and elaborated. Price Thomas and Cleland remove not only the pulmonary fibrous barrier but also that over the chest walls and in the angles of the cavity. The operation (performed through a thoracotomy) may be associated with severe shock and requires strict attention to detail if subsequent infection or re-formation of fibrous tissue over incompletely expanded lung is to be avoided. Penicillin undoubtedly reduces the danger of infection and makes it possible for the surgeon to consider operation on infected cases, subject to obvious provisos. As regards after-treatment, the whole essence is to obtain complete re-expansion of lung, particularly at the apex, as soon as possible. Closed water-seal drainage as a temporary measure to induce expansion has proved inadequate, but suction drainage, using a "pull" of 5–6 cm. Hg has succeeded in bringing the lung out to the chest wall. If this contact is maintained for 5–6 days, later collapse of the lung is unlikely.

ANOTHER NEW INSECTICIDE

THE scarcity and high cost of pyrethrum and derris, whose active principles were until lately the most effective known insecticides harmless to mammals, have stimulated research into synthetic substitutes, and one of the compounds devised, DDT, has already proved a definite improvement on the vegetable products. Lecturing to the Society of Chemical Industry at Liverpool on March 9, Mr. Roland Slade, D SC, of Imperial Chemical Industries, Ltd., described another promising synthetic compound, the gamma isomer of benzene hexachloride, $C_6H_6Cl_6$, which has been named 'Gammexane.' Crude benzene hexachloride, first made by Michael Faraday in 1825, was found to be a useful though somewhat inconsistent insecticide, and ICI incorporated it in their flea-beetle powder in place of derris in 1943. Its activity, however, was soon observed to be almost entirely due to the 10–12% of gamma isomer present. Gammexane is a colourless crystalline substance, melting at 112° C, almost insoluble in water but soluble in organic solvents, practically inodorous, and with a bitter taste. It can be used as a spray in solution, diluted with kerosene, or as a stable emulsion in water; it can be dusted as a diluted powder; or it can be volatilised on a hot-plate, being stable at high temperatures. It has proved successful against a wide range of insects and other pests, including house-flies, bed-bugs, lice, and fleas. When scattered at the rate of ½ lb. per acre it killed 97% of the larvæ of *Aedes ægypti* in 2 days, and 100% in 3 days; this compared with 43% in 2 days and 97% in 3 days with the same quantity of DDT. When tested against the African migratory locust, of which ICI maintain the only colony in this country, a bait containing 0·05% of gammexane killed 96% of the locusts in 2 days, whereas 0·2% of DDT killed 57%. A preliminary trial leads to the hope that gammexane will rid agricultural land of wireworms. Toxicity tests have shown it to be highly toxic to fish, but its toxicity to rats is low—30 mg. could be fed daily for 5 weeks without effect. These tests are no doubt being extended to other mammals, and as Dr. Slade said, its action on the skin will have to be carefully watched.

DEVELOPMENTS AT BIRMINGHAM

THE Birmingham experiment in reablement now has four years of successful experience to its credit. During 1944, according to the fourth annual report of the Accident Hospital and Rehabilitation Centre, the buildings of the old Queen's Hospital were finally adapted to suit the needs of the accident service, and the outpatient department, designed for the immediate treatment of such cases, was opened last August. "Short-stay" cases, admitted for less than 24 hours, are accommodated in a ground-floor ward near the department. A burns unit of two wards has also been opened during the year, under the joint direction of the clinical director and Dr. Leonard Colebrook, who has been seconded for the purpose by the Medical Research Council. The rehabilitation department has suffered from having its three section—physiotherapy, occupational therapy, and gymnasium—separated by considerable distances inside the hospital, but despite this, attendances during 1944 amounted to 75,081. A building licence has been granted for necessary alterations; when these have been made all three sections will be intercommunicating and on the same floor. A patients' rest-room, where meals can be served, will form part of the new unit.

In an address to the Royal Institute of Public Health and Hygiene on Feb. 28, Dr. Harold Balme suggested that in the future we should provide many more accident hospitals, or establish centres undertaking the first stages of reablement in all acute hospitals. Long-stay cases, in his view, should be treated in orthopædic hospitals or in reablement centres outside the towns. Experience at Birmingham will be a guide for such centres when they are set up.

FRENCH STUDY OF PERSONNEL SELECTION

A FRENCH mission, headed by Médecin-Général Costedoat, inspector-general of French Medical Services, has been visiting this country to study the methods of selection used in the British Army. They saw how recruits, men requiring reallocation, and candidates for commissions are tested, interviewed and otherwise assessed by the Directorate of Selection of Personnel; and, although they were primarily concerned with the Army and the ATS, they also saw something of the similar selection procedures developed by the psychologists in the Admiralty and the Air Ministry. The mission included Prof. J. A. Stoetzel, of the École Normale Supérieure in Paris, M. B. Lohy (son of Prof. J. M. Lohy, the psychologist, who was killed by the Germans), and other military and naval officers and civilian psychologists.

EPSOM COLLEGE.—*St. Anne's scholarships* will shortly be awarded to girls attending Church of England schools. Candidates must be fully 9 and under 16 years of age, and must be orphan daughters of medical men who have been in independent practice in England or Wales for not less than five years. The value of each scholarship is dependent upon the means of the applicant and the locality and fees of the school selected. A *Christie Pension* of £89 a year and a *France Pension* of £30 a year will be awarded in May to necessitous medical practitioners, fully 55 years of age, who have been registered for five years. Forms of application for the scholarships and the pensions can be had from the secretary's office, Epsom College, Surrey, and must be returned by April 26.

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In England Now

A Running Commentary by Peripatetic Correspondents

Professor Grey Turner has made a timely plea for livelier museums, where students will enjoy meeting, talking, and discussing; for the more frequent changing of exhibits, and for a more imaginative set-out. Dr. Joan Ross had gone far to meet him by collecting and arranging the exhibition of war wounds specimens now on view at the Royal Society of Medicine. War wounds at present are, of course, our life, and it doesn't need sugar icing to attract us to such an exhibition; but the set-out is magnificent. Dr. Ross shared front-line risks to get these specimens, and sent them home by air in specially adapted shell-cases. Striking exhibits are the injuries due to land mines. A chart explains three main types of mine. The "teller" mine, which looks rather like a warming pan, has been shown in all the daily papers; the "schumine," which is a wooden-box affair, not detectable by the ordinary metal mine detector; and the "S" mine which jumps up into the air and hurls shrapnel balls, tintacks, &c., for as far as 150 yards. The avulsed limb of such a mine injury is well shown, and the tendons, pulled out of their muscles, dangle from the upper end; the skin is turned back like the gauntlet of a glove and the black mud of Italy can be seen driven deep into the musculature: even after several washings the bottom of the specimen jar is still covered with mud which has filtered out. The sight of this gritty musculature teaches how difficult it is to do an adequate excision in such cases. Another specimen shows the extensive shattering of the calcaneus from a mine injury. Little wonder that so many of these cases end up with an amputation. Other specimens show the pathology of gas-gangrene; and in a remarkable specimen of fat embolism almost the entire corpus callosum appears to be involved.

Mr. Hennell's coloured photographs of the first cases in which local penicillin was tried on skin and muscle lacerations will be of historical value. The immediate end-results of such sutured wounds can be seen, without trace of inflammation, no swelling, not even a hint or a tint of redness. Brain operations, too, have been beautifully photographed. In one of particular interest a fascia-lata graft is being applied over the surface of a brain for an orbital-plate injury. The camera also records the superficially blistered hand of the airman who had worn his kid gloves while fighting, and the scarred claw of the airman who had discarded—possibly carelessly, possibly defiantly—his gloves. The air-raid casualty is shown as he appears first, his face caked with blood and mud, tattooed and battered by bits of brick and mortar, and lashed by bits of wood and glass, which stick out.

Methods and devices are well shown in Mrs. Trew's drawings. We see the Thomas splint being used for the unconscious patient to rest his back on while the shoulder plaster spica is applied; later the splint is withdrawn. The ambulance-drip is shown, and the special clamp device fitted on to the stretcher, so that transfusion can continue while the patient is being carried. Pictures also tell the story of the wounded receiving penicillin. One man, according to the drawing, has four MRC bottles hanging over the top of his bed—giving him intravenous saline into his arm, penicillin into his thigh, gastric tube suction down his nose, and (as he seems to have had a colon and bladder wound), supplying a draining suction suprapubic tube; from the colostomy a tube leads to a petrol-tin at the side of the bed. Heath Robinson might well have been jealous.

The exhibition has one other important advantage: there is not too much of it.

* * *

When my grandchildren gather round, and, just to please me, ask about this war, I shall probably find that some of my choicest recollections concern mud, which is far from being the characterless mess that its lack of literature suggests. We in the RAMC of course do not become so intimate with it as do the infantry, but we often reach a point of close association and mutual attachment. For instance, there was the rich almost oleaginous mud over which we set up our first tents in 1939. This was reputed to produce the best sugar-beet in France, and from its nutritive appearance there seemed no reason to doubt this claim. There was so much of it everywhere however that we were soon seeking alternative useful employment for it, and eventually applied it—with considerable originality as we thought, and suitably mixed with glycerin and heated in petrol cans—for the effective relief of our many rheumatic sufferers. This resulted later in a friendly visit from a medical general, and more unexpectedly in a "write-up" in an American journal.

Then there is the mud of the Nile valley, which might be considered as the primordial slime of all civilisation. Indeed Diodorus and many equally reliable observers went further and asserted that "Out of the mud of the Nile, by the heat of the sun, are engendered frogs, toads, snakes, and mice; for can one not see them oozing out of it during the warm months?"—and seeing is believing. Some of the mice in this interesting series were later recorded as being "perfectly formed in front but unfinished behind," which seems to suggest that the method of spontaneous generation had its percentage of failure, although it was only officially superseded in comparatively recent times by Harvey's famous *Omnia ex Ovo*. From my own observations in the neighbourhood I would have been more inclined to conclude that the scorpion—a known inhabitant of the palæozoic scene—might arise de novo from the local sand; there always seemed to be one lurking in my tent. Or if a synthesis be considered to be more probable in such a case my suggestion would be sand 50% : original sin 50%.

The mud of Iraq is something quite special. It was a standing order in Paiforce that all desert roads were to be considered automatically as shut for three days after half an hour of heavy rain. This resulted in us always having to carry rations for that period if we left camp. The only vehicles which defied this order, and the mud, were the impressive flag-flying "passion-waggons" in which love-lorn brigadiers (who were responsible for these orders) ploughed their way to tea-parties in the Sisters' messes.

Sicilian mud is good, but not nearly so effective. The volcanic origin of its chief constituent reduces the viscosity, and renders it merely muddy. No Wellington boots are ever sucked off their wearer by this second-grade product of a country which, despite the pre-war advertisements, has been shown to be tolerable only for 3 months of the average year.

Of the mud of Normandy a more vitriolic pen than mine must write . . .

* * *

Yesterday I got 3 inches of tricoloured ribbon sent me—my 1939–43 star—and my erector pilæ and spinæ, and a few of the same trade union, went into spasm—i.e., I got a thrill out of it. I remember feeling the same only more so when I got my Scout badge and my 1st XV colours. I am not being naïve, but I hold it to be the duty of a naturalist to observe and study dispassionately his own home guineapig, and it is a matter of interest that a middle-aged man, well past the time of display, should thrill when presented with a bit of ribbon; a phenomenon which even *The Golden Bough* deals with inadequately. The fashionable attitude—"O what *have* they sent me now! It's the O.M. No, no. I don't like the colours. Send it back"—deceives nobody; they rarely do send it back.

There is a great need for a really full-undress book on the biology of man, dealing with such subjects, and personally I think the best criterion of civilisation is the degree of the understanding of man by man. In many ways the Americans are more civilised than we are. For instance, I learn from an American magazine that Mrs. Eisenhower is just charming Mrs. Eisenhower, runs her flat, stands in queues, and is just an ordinary citizen. In England the female tends to assume the cock's plumage; even the wife of the Minister of Twiddly will certainly be chairwoman of half a dozen societies for helping somebody and do very good work. But it is an illogical position; it is a survival from the time when the family was the unit, not the individual.

CORRIGENDUM.—In our leader on scrub typhus last week the temperature needed for mites to become active should have been stated as 65° F.

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Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

Sir Archibald Sinclair, Minister for Air, and one of the last orators in the tradition of Gladstone, in the discussion on Air Estimates pointed out that "The extent of our mastery in the air is illustrated by the reduction in casualties incurred by squadrons of Bomber Command." It is even more vividly illustrated by the photographs of destroyed Cologne and other German cities taken from ground level. This "swelling crescendo of destruction" surging forward into Germany is one of the most astonishing features of the war. The problems which the medical and more especially the hygiene organisations of Civil Affairs will have to deal with in Germany are great.

Since March 13, the hours of sitting of the House have reverted to something like pre-war conditions. During the war the House has been meeting at 11 and adjourning at 5.30 or 6.30. Now the time of assembly is 2.15 and the hour of closing 9.15 with an adjournment extension for half an hour. On Friday, as before the war, the hours will be 11 AM till 4 PM. Change of hours of the House do not make a peace, but they are at least an indication of the way the peace-wind is blowing.

Miss Rathbone was the first speaker in the debate on family allowances after the opening by Sir Wm. Jowitt, and she described herself as the Grandmother of the Bill. She might have claimed a nearer relationship, as it is certainly largely owing to her advocacy and persuasive argument over years that the Bill now comes forward. The opinion in favour of making payment to the mother is so widespread that it seems likely that there will be no division when the matter comes to be decided by an amendment on the Committee stage.

The date for beginning payment of the allowances will be on an appointed day "after the war," and the day for the coming into existence of the milk and meals addition will depend on the local education authorities. Some authorities provide them already, but not all children are provided for, and more explicit information and more guarantees of delivery of milk and meals to all are needed. These allowances will affect over 2½ million families and nearly 4½ million children.

At one time it seemed unlikely that the Government's series of Bills embodying their proposals for National Insurance, Workmen's Compensation and a National Health Service would be tabled in this Parliament. Nothing is certain during the course of this war, but the betting is now in favour of a good deal of progress in this direction.

This week's Bill on income-tax has a special interest for the medical, dental, and other professions, as it substantially increases allowances in respect of all kinds of medical necessities. The present proposals will mean that a doctor purchasing a motor-car will get an immediate allowance of 20% for depreciation plus 25% for wear and tear for the first year. Subsequent allowances for depreciation will be at the rate of 25% of the balance outstanding. A dental chair, or other expensive item, will be dealt with in the same way. Purchases of professional equipment, instruments of all kinds, and other necessary items, will be allowed against income at time of purchase, if of reasonably small amount; if the amounts are large, they may be treated in the same way as payments for motor-cars. These arrangements will, it is hoped, be of value to doctors re-equipping themselves for practice after war service.

There is to be a debate on relief for Liberated Europe at an early date, and Mr. Attlee, Deputy Prime Minister, has been visiting France and Belgium to contact the governments of these countries. The House is not satisfied with what is at present being done. A report of the Far Eastern regional committee of UNRRA which was held at Sydney, Australia, from Feb. 15 to 20 under the chairmanship of Mr. T. F. Tsiang, representative of the Chinese Republic, is given in Hansard. It was at this meeting that Mr. Evatt, as representative of Australia, called for vigorous attack on the relief problems and, on his proposal, a resolution was passed for action by UNRRA, the governments and other authorities concerned, to provide relief immediately upon liberation with the maximum degree of decentralisation.

No doubt his words will find an echo in the House of Commons, and the lead given by the meeting in the Far East may stimulate action in Holland, Belgium, France, and Italy.

FROM THE PRESS GALLERY

Family Allowances

In moving the second reading of this Bill in the House of Commons on March 8 Sir WILLIAM JOWITT said that the Government's primary object was to ease the financial burden which at present oppressed parents with large families, and so promote the health and well-being of their children. But this Bill was not intended to be an answer to the complex problem now engaging the attention of the Royal Commission on population. If they were aiming at population family allowances could at their very best be merely a partial aid. Under any wage system, as he conceived it, whether in capitalist or socialist society, the remuneration which the worker got must depend on the services which he rendered; it could not depend on the size of his family. The needs of a father of a large family, if he was to keep his children in a decent state and in health, must obviously be very different from the needs of a man without children, and Sir William went on to quote the Vicar of Wakefield, who had six children and who was "ever of opinion that the honest man who married and brought up a large family, did more service than he who continued single, and only talked of population." The Minister emphasised however, that the object of the Bill was not to filch from parents their responsibility, but rather to help them to discharge that obligation as they would desire. Moreover, the Bill must be regarded in its complete setting, with antenatal services, maternity services, child welfare, school meals and national health services. Still, after every allowance had been made for these schemes, there remained a gap that could only be filled by cash payments made without a contribution or a means test by the Exchequer.

The Government had decided to leave the question whether the allowances should be paid to the father or to the mother to a free vote of the House at the committee stage. But if they decided in favour of payment to the mother the House must realise that so far as income tax was exigible on the amount it would be payable by the father. Nor must it be thought that by paying the mother the father was relieved from the duty, morally and by law, to maintain his children.

Thirdly, there would be no duplication with allowances paid under other schemes; there must be no dodging the issue by saying that this was not a duplication because one payment was made to the husband and another to the wife. All that had been said about the appointed day on which the Bill was to be brought into operation was that it should be after the war. He was expecting to receive applications from 2,500,000 families in respect of 4,400,000 children. The task of getting the necessary machinery in order was a very big one, and it was obvious that payments could not be started in the near future.

Miss RATHBONE, who opened the debate as grandmother of the proposal, thought the amount of the allowance was too small and the age limit was too low. Sir WILLIAM BEVERIDGE would have preferred to see more of the allowance in cash and less in kind. Dr. E. SUMMERSKILL put forward a plea for the illegitimate child who was usually the first and only child. Mr. A. BEVAN asked what justification there was for not supplementing unemployment benefit or workman's compensation by these allowances?

UNRRA Conference at Sydney

In the House of Commons on March 7 Mr. GEORGE HALL, Under Secretary for Foreign Affairs, made a statement on the conference of the United Nations Relief and Rehabilitation Administration held at Sydney from Feb. 15 to 20 under the chairmanship of Dr. T. F. Tsiang, representative of the Chinese Republic. His Majesty's Government were represented by Sir Paul Butler, a distinguished member of the Foreign Service, with wide Far Eastern experience. Australia, France, India, the Netherlands, New Zealand, and the United States of America were also represented. The sub-committee on agriculture submitted recommendations

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to increase the production of rice and encourage the use of alternative cereals in liberated areas, and for the establishment of a veterinary consultative body for the Far East, similar to that suggested for Europe. The subcommittee on health presented a draft agreement for the health and sanitary control of displaced persons in the Far East. These and other recommendations of the subcommittees were accepted. The committee also adopted resolutions regarding the importance of arranging for transport facilities as early as possible, and the supply of regular information to the committees and the Administration about the conditions in occupied countries. The chairman was given power to call another meeting of the committee, if necessary, before the next session of the Council. The most important resolution adopted was that proposed by Dr. Evatt, which made three recommendations:

(1) that the Administration should arrange with the Governments and other authorities concerned for the earliest possible measures to be taken to provide relief immediately upon liberation;
(2) that the maximum degree of decentralisation should be established between the central and regional offices of the Administration; and
(3) that the officers of the Administration should be selected, with due regard to their special local knowledge, from a wide range of member countries.

QUESTION TIME

Doctors and Military Service

Sir E. GRAHAM-LITTLE asked the Minister of Health whether he had considered the example submitted to him of the dissatisfaction amongst senior medical officers serving abroad at the small proportion of newly qualified medical practitioners who were called up for military service abroad in exchange for senior officers and the large number who were drafted into the Emergency Medical Service at home; and whether he would inquire into and remedy these conditions.—Mr. H. WILLINK replied: The great majority of newly qualified medical practitioners fit for military service are already being called up after short periods in resident hospital appointments, which are necessary to provide the experience required for subsequent military service. Resident hospital posts are limited in number to the minimum war-time establishments approved for each hospital by the Central Medical War Committee and it is the policy of that committee wherever possible to call up the holders of the senior posts after a certain period so that a proper flow of young practitioners through these posts to the Forces may be maintained.

Choice of Doctor

Mr. M. P. PRICE asked the Minister whether he would consider the alteration of the regulation which insists that a person in receipt of a supplementary old-age pension should only have a medical practitioner appointed by the public assistance committee of the county; and whether, in future, a free choice of doctor could be permitted.—Mr. WILLINK replied: Most supplementary pensioners are entitled to medical benefit under the National Health Insurance Acts with a free choice of doctor, and only a small proportion obtain medical treatment through the arrangements made by public assistance authorities. These arrangements may with my sanction include a choice of doctor, and sanction for arrangements of this kind has already been given to about 30 authorities.

Women Medical Students

Sir WILLIAM BEVERIDGE asked the Minister of Labour if he was aware that many women over the age of 19 had had their medical studies since 1943 interrupted, after passing their first medical examinations, by national service; that two of the three London medical schools which admitted women were about to hold entrance examinations to select students for the second medical course starting next October, but that successful candidates in the above age category could not be allotted vacancies without his approval before the examination results were known; and if he would allow such of these women as reached the requisite standard at these examinations for securing admission to the schools to accept places provisionally. Mr. E. BEVIN replied: In consultation with the Minister of Health, I am making arrangements by which medical schools may consider provisionally applications from women of any age who wish to be admitted next October. The question whether selected candidates will be permitted to begin their courses at that date will, of course, depend upon the national situation.

Supplies to Poland

Miss E. RATHBONE asked the Secretary of State for Foreign Affairs whether any reply had now been received from the Government of the USSR giving permission for a delegation or supplies from UNRRA to reach Poland or any districts in Russia where Polish or other deported persons were in need of assistance.—Mr. A. EDEN replied: I am informed that the Russian authorities have promised UNRRA facilities for the transit of supplies to Poland. Arrangements for the transit of a delegation are not yet concluded, but the despatch of supplies is not being delayed on that account.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Sir William Collins, who in 1943 gave £100,000 to extend the department of pathology at Lincoln's Inn Fields, has sent the following letter to Sir Alfred Webb-Johnson, PRCS.

My dear President,

When I gave you the first £100,000 for the endowment of the Department of Pathology and the institution of a Chair of Human and Comparative Pathology at the Royal College of Surgeons, I promised to provide in my Will that you should receive another £100,000 for the College for the endowment of the Department of Anatomy and the institution of a Chair of Human and Comparative Anatomy.

Since then I have visited the College several times and seen the very good work that you are doing, which has inspired me to think over the matter. I feel that if you had the promised second £100,000 today you could straightway inaugurate the endowment of the Department of Anatomy, and we could then both see the two Professorships functioning.

I therefore enclose my cheque for £100,000 for this purpose.

Yours sincerely,
W. H. COLLINS.

A CHAIR OF MEDICINE

THE University of Manchester are anxious that medical men serving in the Forces should know of their intention to appoint a whole-time professor of medicine. The new professor should if possible take up his duties on Sept. 29, 1945, but if the doctor appointed is at present in the Services the university would consider postponing this date. The chair will carry a stipend not exceeding £2500 a year, and applications, which should be brief, should be sent to the registrar of the university before April 24. Particulars of the proposed appointment were circulated through Service channels several weeks ago.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED MARCH 3

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1461; whooping-cough, 1462; diphtheria, 470; paratyphoid, 3; typhoid, 13; measles (excluding rubella), 22,480; pneumonia (primary or influenzal), 905; puerperal pyrexia, 124; cerebrospinal fever, 77; poliomyelitis, 4; polio-encephalitis, 0; encephalitis lethargica, 0; dysentery, 399; ophthalmia neonatorum, 67. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on Feb. 28 was 1208. During the previous week the following cases were admitted: scarlet fever, 30; diphtheria, 23; measles, 148; whooping-cough, 19.

Deaths.—In 126 great towns there were no deaths from enteric fever, 2 (0) from scarlet fever, 18 (0) from measles, 10 (0) from whooping-cough, 10 (1) from diphtheria, 58 (10) from diarrhœa and enteritis under two years, and 39 (6) from influenza. The figures in parentheses are those for London itself.

There were 11 deaths from diarrhœa at Birmingham.

The number of stillbirths notified during the week was 213 (corresponding to a rate of 29 per thousand total births), including 28 in London.

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Letters to the Editor

MEDICAL STAFF COMMITTEES IN MUNICIPAL HOSPITALS

SIR,—As a member of that unpopular class, the Medical Superintendent, and one who—extraordinary as it may appear to many—is proud of the work he does and feels that he is filling a very important function in his hospital, I have delayed entering into the controversy which has gone on so long in the medical press. But reluctantly I feel that the letter of March 3 by "Assistant Medical Officer" calls forth not defence but counter-attack.

Most medical superintendents today are in their 30's or 40's, and out of those I know only two are 60 or over. I know many senior physicians and surgeons of voluntary hospitals, who hold in fact far more dictatorial powers, who are over this age; and apparently it is considered in order for them to have this power. I see no object in medical staff committees in municipal or voluntary hospitals unless they contain not only the senior but also the junior staff. In many municipal hospitals the senior staff are part-time; only the juniors are full-time, and they are far more intimately concerned with the welfare of the institution. It is one of the functions of a medical superintendent to retain close contact with the whole of his staff, medical as well as non-medical, and he would be a bad superintendent who was unaware of the desires and views of members of his staff.

In my own hospital, and in those municipal hospitals with which I am intimately acquainted, every member of the staff has access at any time to the medical superintendent, and no difficulty is met with in formulating proposals for improvement and alteration in the hospital services. That does not mean that in every case the medical superintendent agrees, or is able when he agrees to persuade the hospital committee to act upon the recommendations; but strangely enough I have experienced an exactly similar state of affairs in voluntary hospitals, where the hospital committee has not invariably agreed to the suggestions made by members of the medical staff, either collectively or individually. Most medical superintendents are delighted when their senior staff are sufficiently interested in the welfare of the hospital either to make suggestions to him or to request an opportunity of meeting the hospital committee; and from my own experience the hospital committee has been more than flattered at such a request, and has always granted it.

After a period during which they tended to lose their clinical interest and become administrators solely, more and more medical superintendents are remaining clinicians. They have realised that their work is better understood, and can be made more useful to the community, when they retain their clinical interest and maintain their clinical status among their senior staff. Men like Clark of Sheffield and McCormack who was at St. James', Balham, are household names, and bear comparison in their clinical work with any consultant, no matter how eminent.

Halifax General Hospital. H. I. DEITCH.

A CHAIR IN PSYCHIATRY

SIR,—Brigadier James calls attention to the anxiety aroused in Service doctors by the activities of some of their civilian colleagues at home. This anxiety is without doubt acute, widespread, and very real. The proposal to fill the chair in psychiatry at London University by Sept. 1 has caused frank consternation. Service doctors ask for no special privilege; all they seek is equal opportunity. They regard this instance as the writing on the wall, and they have a sharp feeling that their individual futures are being prejudiced and rendered insecure.

Until comparatively recently Service doctors overseas have been able to apply themselves wholeheartedly to their Service duties, in the belief that their interests at home were being jealously safeguarded by their civilian colleagues. Incredulity is being rapidly succeeded by feelings of frustration, and, which is worse, distrust.

Brigadier James speaks only too truly. It is essential that no split in our profession is allowed to develop. Nevertheless, if the profession at home were to discard the principle of equity, such a split would be inevitable.

My work brings me into contact with many Service doctors in all branches of medical work. I am reflecting their thoughts and their views. It is most earnestly hoped that the civilian authorities will in their wisdom realise the urgency of the need to still the doubts and to allay the resentment and anxiety which their proposal at this stage of the war to fill a university chair has stirred up among Service doctors overseas.

J. D. W. PEARCE,
CMF. Adviser in Psychiatry, AFHQ.

SIR,—The London chair of psychiatry is indeed important, for much of the future of psychiatry is involved in its fate. Psychiatry's significance for society has been shown during this war by EMS and Service psychiatrists to be greater than was ever suggested in peace-time, even by the chair concerned. Plans for teaching and research in the subject should be made at the earliest moment possible; and the decision, after some years of delay, to appoint a professor to this—the only chair in England—can hardly be called precipitate or ill considered. Any further avoidable delay would be reprehensible, and the London County Council's present eagerness to fill the appointment is one which many will commend.

The decision to allow psychiatrists, both in and out of the Services and the LCC, to apply for the chair is proper, but unless sufficient time is given for all who might be interested to apply, it may not be implemented. You will have heard, Sir, that except in matters which concern operations and their planning, Service channels of communication are no quicker than jungle roads, mountain highways, and the voyages of fighting ships allow, and at times are even slower than this, for the serving doctor has no assured tenure of address. To get and read advertisements, to arrange and get proper references, to formulate a suitable application, and then get it to London, may take some serving psychiatrists more than six months.

London University might do well to follow the example set by my own university which last year invited applications for the vacant chair of surgery at Newcastle. A preliminary date by which applications could be received was fixed some months ahead, but a loophole was left for late applications, and in addition, the following statement was circulated through Service channels to all serving doctors:—

> "... the University will make no appointment until it is satisfied that persons serving overseas have had full opportunity to apply, and the professor, if on national service, will not be required to take up his duties until his release from such service on the termination of hostilities or on such earlier date as may be possible."

It is true, as your correspondents have stated, that doctors serving abroad are sensitive about the deprivations they suffer, and at times compare their lot with that of their colleagues in the homeland; but even in the darkest days of the MEF they were upset only when someone in the United Kingdom so forgot his responsibilities to them as to further his future at the expense of theirs. The model statement of Durham University recognised that we "gentlemen in England now abed" can reasonably ask serving doctors overseas for further sacrifices in the present, only if we ourselves zealously guard their future. We can take satisfaction in the certainty that they, at least, can do no personal canvassing for appointments, but we must be careful to ensure that they have the same opportunities of applying in writing as their professional brothers in Britain. There is no need for generosity, but equity is their right.

The profession need not search its conscience because the Goodenough Committee took evidence only from three civilian psychiatrists, and from none of the hundreds of psychiatrists in the Services; it was a non-professional body. But if the only chair in England recommended by it for the responsibility of teaching post-graduate psychiatry were filled before psychiatrists overseas had ample time to apply for it, permanent cynicism would arise in many members of the profession—as any future professor of psychiatry will know.

T. F. MAIN,
Late Adviser in Psychiatry, 21st Army Group.

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RETURN OF THE BLOOD TO THE HEART

SIR,—The answer to Dr. Penman's question is very simple. When a tourniquet is applied for the purpose of an intravenous injection the dilated veins become more prominent on clenching the fist because they are pushed against the skin by the swollen and hardened muscle-bellies. If the fist is kept clenched this prominence may in the next few seconds become yet more pronounced as more blood enters the arm, *but it is no greater if the fist is alternately opened and clenched.*

Before Dr. Penman's letter appeared three of my colleagues came to me with the same question. By a demonstration on the arm of one of them I convinced them that this observation was correct. The idea that alternate contraction and relaxation of the muscles increases the distension of the veins by a pumping action is an excellent example of the facility with which the senses can be deceived and practice influenced by belief in a preconceived theory which has no basis in fact. In this case the whole of the profession seems to have been taken in.

Cambridge. FF. ROBERTS.

MENINGITIS FOLLOWING SPINAL ANÆSTHESIA

SIR,—Your correspondents have properly emphasised two major factors which may give rise to infection during the administration of a spinal anæsthetic—namely, the (ab)use of spirit and of "sterile distilled water." But insufficient attention is paid to the certain contamination of the needle if it is held in the bare fingers, whether or not the hands have been thoroughly washed, for the skin can never be rendered sterile. If the hands are wet, however carefully one handles the needle, it is certain to get moistened and contamination has then occurred. Gloves are the obvious precaution, but there is a simple alternative as suggested by Dr. Mills.

The needle is held through a small sterile towel, the hands being *absolutely* dry. To ensure their dryness it is better *not* to wash up; the hands are then consciously recognised as "dirty" and a perfect no-touch technique will be practised. Slight practice is necessary to acquire the knack, but once obtained there is a great saving of time.

Many thousands of lumbar punctures must have been performed in this neurosurgical unit, by this method of holding the needle through a towel, with never a case of resultant meningitis. It is absolutely reliable, and I believe practised by the entire neurosurgical fraternity.

Neurosurgical Unit, Chase Farm Hospital and London Hospital. D. W. C. NORTHFIELD.

PREGNANCY AND PULMONARY LOBECTOMY

SIR,—In your issue of Dec. 16 last Mr. Graham Bryce and Miss Mills remark that there are few recorded cases of pregnancy following pulmonary lobectomy or pneumonectomy. The following somewhat unusual case may therefore be worth recording.

A single girl of 22 was referred on Jan. 4, 1943, to the Nottingham City Hospital from the tuberculosis clinic for "? non-tuberculous unilateral bronchiectasis of the left lung"; surgical resection of the lung was suggested. She was admitted under the care of Dr. S. B. Benton, and investigations in hospital led to the diagnosis of congenital cystic bronchiectasis of the left lung. The right lung was found to be free from disease by clinical and bronchographic examinations. Her physique was moderate, stature below average, and weight 6 st. 8 lb. A definite midthoracic scoliosis to the right was present, which had been treated at an orthopædic clinic when she was 12 years old.

Mr. G. A. Mason did a left pneumonectomy on Feb. 20, and she made a good immediate recovery. On March 8 it was noticed that she was 16–18 weeks' pregnant. Her chest condition was not such as to warrant interruption of the pregnancy, but after arrangements had been made to discharge her from hospital, she had a spontaneous abortion on March 27. The fœtus and placenta were macerated and the fœtus had evidently died some considerable time before. The abortion did not distress her cardiorespiratory system to any extent and she made a steady recovery from this unexpected intervening condition. She was discharged on April 6—6½ weeks after operation. Bronchoscopy and bronchography on May 22 showed her chest condition to be wholly satisfactory. Her weight was 6 st. 7 lb.

Some two months later she became a hospital cleaner and she was able to do the work without any respiratory embarrassment. I saw her again at the hospital antenatal clinic on April 28, 1944, when she was 20–22 weeks' pregnant. Her physical condition had improved beyond the standard before pneumonectomy, and her weight was 7 st. 4 lb. Her chest wall was well healed and the right lung seemed normal. She pursued her employment as a cleaner, though advised not to do so, until August 1, when she was 34+ weeks' pregnant. At this time her vital capacity was 1500 c.cm.

An intermediate degree of pelvic contraction was present, but she was spontaneously delivered of a living female infant after a labour of 21 hours on August 28. The second stage occupied 2 hours and normal progress of the labour and her freedom from any cardiorespiratory embarrassment made assistance unnecessary. A careful watch was kept for any undue dyspnœa with each pain in the second stage, but none was observed. Nitrous oxide was given for the delivery only, and was tolerated well. Her puerperium was uneventful and she was discharged with her infant on Sept. 15. Since then her chest condition has remained satisfactory.

This girl seems to have had an unusual tolerance to physical strain, despite her impaired physique. For many years she had to all intents only one normally functioning lung, and this had sufficient reserve to withstand the repeated obstetric demands made upon it.

I must thank Dr. Benton for access to the case-records and Dr. C. L. C. Crowe, medical superintendent of the hospital, for permission to publish this case.

Nottingham. J. B. COCHRANE.

ACCOMMODATION FOR WOMEN STUDENTS

SIR,—We, the undersigned, all received our medical education in different medical schools of London voluntary hospitals, which at that time were providing coeducation—namely, St. Mary's, St. George's, University College, and the London Hospital.

In each hospital special accommodation for women students was limited to the provision of a cloakroom and lavatories, and in the case of one or two of them a common-room also. For women resident medical officers no special accommodation was provided; bedrooms, sitting-rooms, common-rooms, bathrooms, and lavatories were used, as they would be in an hotel or boarding-house, without any sex discrimination.

It would therefore appear that there is no legitimate reason on the score of lack of accommodation for delaying the entry of women medical students into the medical schools and hospitals which are at present reserved for men only. It should not be an insuperable difficulty, even in war-time, to provide a common-room (if it is thought necessary), a cloakroom, and lavatory accommodation for women medical students.

DORIS G. LITHERLAND. DOROTHY M. HOWSE.
MARY G. MITCHELL. PHŒBE WOODWARD.

Bournemouth.

COUPONS FOR BELTS

SIR,—We have just had a very good instance of the hardship which you mention in your annotation of March 10. We manufactured a surgical belt for a soldier in hospital with an incisional hernia. Our representative called at the hospital with the completed belt, but as the patient had no clothing coupons the belt was brought back. Soldiers, we believe, get ten coupons a year, and the next issue is probably in June. As we understood the case was very urgent, we broke the law, which incidentally made us liable to fines or imprisonment, and supplied the patient with the belt. At the same time we notified the Board of Trade that we had done this.

Wigmore Street, W1. ALLEN & HANBURYS LTD.

IN MEMORY OF SIR THOMAS BARLOW.—Of his hundred years Sir Thomas Barlow spent seventy on the staff of Great Ormond Street Hospital, and the hospital felt him so peculiarly their own that they held a small "family" service in his honour at their chapel on March 7. Sir Robert Hutchison, who was Sir Thomas's house-physician at the hospital nearly fifty years ago, spoke at the service and said that Barlow would be remembered both for what he did and for what he was.

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Obituary

BERTRAND DAWSON
VISCOUNT DAWSON OF PENN

PC, GCVO, KCB, KCMG, MD, BSC LOND., DCL, LLD, FRCP

FEW men hold high position for any great length of time. Yet Lord Dawson was a public figure for more than a third of a century. In Edwardian days he was already a famous physician, and during four reigns he was a leader in his profession and the adviser of governments.

His was the greatness of general ability rather than some particular excellence: in many different ways he was a shade better than the average first-class man. He was a good representative of doctors because he was a doctor like themselves—with the same sort of skill, the same interests, the same intentions. He was effective among legislators because, for all his special knowledge, they found him a man of affairs like themselves, in no way eccentric. But he was more than a representative and a politician. Successful, shrewd, a man of the world, he was also a devoted exponent of reform, deeply desiring the health and happiness of other people. In this he sought, and secured, greater influence for medicine: he believed that it must play an increasing part in the modern world, and he strove to obtain for his profession its proper place, and fitness to do its proper work.

He was a doctor first and all the time, and with worldly eminence his bearing towards medical colleagues and students never changed.

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THE DOCTOR

Bertrand Edward Dawson was the son of an architect, Henry Dawson, FRIBA, of Purley in Surrey, and was born on March 9, 1864. From St. Paul's School he went to University College, London, where he studied chemistry, physics, and physiology. Ever afterwards he was proud of his B Sc degree (1888), and he approached medical problems with a physiological bent; he focused on function rather than structure, and the damaged heart was of less interest to him than what the patient was able to do with it. At the same time he was exceptionally well grounded in morbid anatomy; for when he had qualified from the London Hospital in 1890, and had held the usual junior appointments there, he became pathologist at the Chest Hospital, City Road; and after joining the London Hospital staff in 1896 he demonstrated to students in the postmortem room until the first professional morbid anatomist was elected in the person of Professor Turnbull.

As a young man he was by no means robust, but he was already a hard worker, taking great pains with whatever task was in hand. This habit of concentration helped to make him eventually one of the best diagnosticians of his day. His first principle seemed to be that, once in the presence of the patient, the clock stopped so far as he was concerned. A colleague, who apologised for detaining him when he was known to have important engagements on the same day, received the rebuke "I do one thing at a time." His questions were quietly put, and he would listen patiently; so when the time came to disentangle the symptoms he had a good picture of the person. Intelligence and experience gave him exceptional ability to pick out the signs and symptoms that mattered. But as a clinician he also had the supreme gift of humanity: his humour was spontaneous, his sympathy ready and real; and, as the saying went, he could get inside the skin of a bus-conductor or a duchess within ten minutes. "An important part of therapeutics," he said, "is a willingness to listen, a perceptive understanding mind, and lucid persuasive exposition." He was at his best, perhaps, with those who had carried responsibilities and were now wounded in the battle of life. In his summing-up, not only the disease, not only the man, but the family, the work, the future—all would be encompassed. The details of treatment would be outlined with as much attention to the patient's surroundings as to his disease. Dawson was (to adopt the idiom of today) a master of clinical social medicine and reablement. He was not a specialist but a general physician, and this partly explains why he gained a reputation as a last resort—why the colleague in bed five months under a total of thirteen consultants was cured within three days after taking Dawson's "second" opinion.

His contribution to scientific literature was respectable rather than remarkable. In early days he provided many of the articles for Allchin's *Manual of Medicine*, and he later wrote on stricture of the œsophagus, diseases of the stomach, colitis, and paratyphoid. Over many years he made a serious study of hæmolytic jaundice, and he was happy to relate that one of his patients was a lady whose spleen had been removed by Mr. Spencer Wells. Hypertension always interested him, and he preached that it is the bodily reaction of certain types to their environment: he spoke of "these days when diseases of invasion are receding and diseases of stress loom larger." During the war of 1914–18, when he served in France as consulting physician to the British Expeditionary Force, he published with W. E. Hume and S. P. Bedson valuable work on infective jaundice which but for his efforts might never have been undertaken or recorded.

He was not a scientist of the modern kind: "one can pay him no greater compliment as a physician than by saying that he possessed more wisdom than knowledge." But he kept abreast of the advance of medicine by his innumerable contacts, and in all he heard he separated the wheat from the chaff. He knew how to choose as assistants people with a great capacity for work, and the young men chosen to devil for him remember him with gratitude as having provided them virtually with an education. He helped his juniors to pursue original investigations, and in talking of such work to his father-in-law, Sir Alfred Yarrow, persuaded him to endow the Yarrow research fund at the London Hospital.

Dawson was a good teacher, though somewhat irregular in his attendance because he was so often "doing one thing at a time" somewhere else. When he had to retire after 20 years on the senior staff, the London Hospital made him "extra physician" for another 5 years: he would go down once a week, and he afterwards recalled that "no part of my work afforded me more satisfaction and instruction than Tuesday mornings in the wards, often prolonged till the dinner, and sister's appealing look, caused a retreat." Students flocked to "Bertie's" rounds; and no wonder, for like many other good teachers he was something of a showman, and was not content to show single cases. He borrowed patients from far and wide.

> "I remember," writes a former assistant, "a demonstration of aneurysm of the transverse arch contrasted with carcinoma of the lung invading the superior mediastinum, together with aneurysm of the descending thoracic aorta contrasted with carcinoma of the lung invading the posterior mediastinum. Once in 1924 I suggested to him that he should demonstrate dwarfism and infantilism. His reply was: 'What about giants too?' So a few days later I found myself in Wapping interviewing Adolf Strumpell's famous 8 ft. 2 in. giant then performing in Bertram Mills's circus. Would he come to the London Hospital to see the King's physician for £10? No: he wouldn't come for £20; and in any case he had been X-rayed in Vienna, and then taken to the court of the Emperor Franz Josef."

He got on easily with younger men; and a happy late example of his helpful collaboration was the work done, a

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little before the war, at Lambeth Hospital, where the London County Council made him consulting physician to their heart centre. Here he took a practical interest in the efforts of Laurence O'Shaughnessy and H. E. Mansell to relieve cardiac ischæmia by inducing vascular anastomoses. Unhappily none of the three authors of their reports is now alive.

Lord Dawson was consulting physician not only to the London Hospital but to the King Edward VII Sanatorium at Midhurst, the Royal National Hospital for Consumption at Ventnor, and the Emergency Medical Service. In 1929 he joined the council of King Edward's Hospital Fund; in 1936 he became chairman of the Army Medical Advisory Board; and he served on the Medical Research Council from 1931 to 1935. During this war he presided over the MRC Committee on Tuberculosis in War-time.

THE KING'S PHYSICIAN

No doctor, perhaps, has had a larger number of distinguished patients, and none heard more of their anxieties. Probably no doctor ever spoke less of what he knew. It was this discretion, coupled with conspicuous ability and good address, that made him an ideal Court physician. His first appointment was in 1907, and he was physician-in-ordinary to four sovereigns.

The illness of King George V in 1928 displayed his power to withstand great strain. He had always taken long holidays, and he could recover quickly from fatigue. Now, an elderly man, he had to bear through long weeks almost the whole responsibility of managing, before the world, a most difficult illness on whose outcome much depended. No-one could have felt the responsibility more keenly; but neither nerve nor judgment failed. "I vividly recall," writes one of his team, "the kindly word which inspired confidence and dispelled my nervousness. He never fussed. When he had chosen his man, he left him unhindered to do the job. Nor did he ever omit to give a young man his due credit in private or public."

He was appointed KCVO in 1911, and CB in 1916 for his war service. In 1918 he was promoted GCVO, and in the following year became KCMG. He was created a baron in 1920, and KCB in 1926. Membership of the Privy Council, a distinction he specially valued, was granted in 1929, and a viscounty was conferred in 1936.

THE PRESIDENT

While he enjoyed everything medical, it can be truly said that Dawson loved his own college. The Royal College of Physicians of London was to him hallowed ground; and to be elected by his brother fellows to be their president for seven successive years—something that had not happened for a century—was to him the greatest honour.

His presidency, from 1931 to 1938, was notable for a change of policy. Fearing lest the creation of the Ministry of Health and the Medical Research Council might deprive the college of its position as medical adviser to the Government, he concluded that it ought to be made more representative of medicine, and therefore more influential, by taking into the fellowship men from the fighting Services, from public health, and from specialist occupations such as pathology, radiology, and biochemistry. He thought it "a reproach against our profession that we do not establish means of giving collective advice when the art of government depends increasingly on our knowledge," and he regarded his college as one of the proper channels for such advice. There are those who have their doubts about the departure thus taken from precedent: they believe that a college of physicians is best confined to physicians. But certainly Lord Dawson raised the national status of his college; he set up committees able to offer advice to Government departments, and he gave its affairs fresh life by encouraging the younger fellows to speak their mind.

In his last months he wrote in favour of association of the Royal Colleges to give them the united influence of an Academy of Medicine. An ardent believer in the Empire, he always liked to think of London as a centre of medical learning and inspiration. Besides an Academy he wanted to see here a single large Empire centre of postgraduate medical education, worthy of its opportunities. He had been dean of the London University faculty of medicine, and he was well aware of the reciprocal advantages of closer ties between medical schools in Great Britain and in the Dominions.

Besides his own college, Lord Dawson was president of the Royal Society of Medicine in 1928–30 and of the British Medical Association at its centenary in 1932. Last year, on the death of Sir Beckwith Whitehouse, the Association, faced with great issues, recalled to their presidency the veteran doctor who had won the esteem of Ministers and public. In his inaugural address he expressed part of his philosophy in declaring that "customs, habits, and feelings, many of them centuries old, must not be suddenly uprooted: rather must the new order be gradually grafted on to medicine's historic past. Such is our English way." But his thoughts, none the less, were on the new order.

THE REFORMER

Already in 1918 Major-General Sir Bertrand Dawson was saying that the need for adequate medical service had outstripped its provision, not only for the masses but even for the well-to-do. He prophesied that people would soon recognise the unsuitability of their homes as places for the treatment of the sick, and that larger institutional organisation must follow. Recognising the general practitioner as the central pillar, he sketched a new service based on local hospitals and clinics, for which the larger hospitals would provide consultant and specialist advice. In 1919 he was able to work out these ideas as chairman of an advisory committee appointed by Dr. Addison, the first Minister of Health. The result was the interim "Dawson report," whose short title is justified by the major part he played in preparing it. The committee proposed a scheme of practice in or around health centres which would offer modern methods of diagnosis and be closely linked with central hospitals. This was constructive forward thinking of a high order. But the report appeared in 1920, and a ruthless "economy" campaign soon afterwards removed all chance of official action on it.

It was in 1920 that Dawson was made a peer. Though Lord Lister had preceded him in the House of Lords, Lister's honour was (as the *Times* points out) retrospective, whereas Dawson's was the first attempt to bring medical knowledge into the Upper House. He rightly regarded this task of spokesmanship as important, and took care to see that the medical view was visible to the Lords whenever necessary. Sometimes perhaps his speeches had less effect than they deserved, because he tied himself a little too closely to the manuscript he had so carefully prepared: few speakers can retain the alert attention of their listeners and carry full conviction if they feel themselves obliged to keep to a previously written text. Nevertheless Dawson understood and impressed his audience as well as those who read him next day.

On his special subject of medical reconstruction he showed characteristic foresight in seeking to introduce into the Local Government Bill, 1929, the "Dawson clause," which, referring to municipal hospitals, said that—

> "A council in preparing a scheme under this section shall have regard to the desirability of consulting (*a*) any body existing in the area which is so constituted as to be representative of the voluntary hospitals in the area, and (*b*) any body existing in the area which is so constituted as to be representative of the duly qualified medical practitioners in the area, including those on the medical and surgical staffs of any voluntary hospitals in the area."

Unfortunately this clause was watered down, and it was left merely that local authorities should "make such arrangements as they think desirable for securing that the functions transferred to them . . . will be discharged after consultation with such body . . . as they consider to represent the voluntary hospitals within the area." Much was lost because the local authorities failed to consult as intended.

In 1928, on the Dogs Bill, he persuasively defended experiments on animals. In 1934 he accepted the challenge of the osteopaths. In 1937, speaking in favour of pasteurisation to meet the danger of infected milk, he could not "see what good it was to spend vast sums on health services and leave this bad sore open year after year." He took an active part in finally shaping the

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Marriage Bill of 1937, dealing with insanity as grounds for divorce, and it has been said that his speeches thereon converted "a timid attempt at betterment" into a true measure of reform. In 1938 he successfully brought forward his own Infanticide Bill, which recognised that the killing of infants is sometimes provoked by illness, which should be treated as such.

As a medical student Dawson had spoken in Hyde Park in favour of birth-control, and as a medical statesman he had the courage to astonish the Church Congress by a plain-spoken address on sexual relationships, calling for study of their healthy rather than their morbid aspects. He believed in contraception as a means of improving family and national life rather than a means of avoiding bother. Now that the community relies for its revenue of children on voluntary contributions, he held that reproduction is "no longer the exclusive responsibility of parents but one in which the State has a share." The State, by family allowances and otherwise, should remove obstacles to parenthood; but doctors also must take a more responsible part in building up a healthy race. Today we were preventing the death of the unfit but had not planned any adequate substitute. It was proper that the unfit should be preserved and should be given a kindly simple shelter, but no effort should be made to raise them above their biological level, lest they vitiate the race by propagating their defects. "In our duty and desire to help the unfortunate and afflicted we are being tragically unkind to the next generation."

With this eugenic outlook Lord Dawson combined enthusiasm for getting the fit citizens to the forefront. "If education is needed to get the best out of a girl's or boy's mind, it is unreasonable to expect that it is not equally needed to make the best of her or his body."

Till near the end of his life he continued to enrich the Lords' debates, speaking constructively on the Beveridge report, on scientific research, and on the National Health Service white-paper. He argued that preventive and curative medicine must be brought into a single service—that all medical services must come under one umbrella—but he favoured slow advance. He wanted the Government to begin with the rationalisation of hospital and consultant services, and leave general practice for the present untouched. He was firmly against employment of doctors by local authorities "naked and unadorned." Yet he believed, as in 1929, that through better opportunities and responsible contact with the health organisation of local government, the centre of gravity of practitioners' work will move towards prevention and early diagnosis and that they "will rise up as the interpreters of health to the people."

THE MAN

The accompanying photograph of Lord Dawson shows him in his physical prime. Later his face changed and its lines grew deeper; but, as the friend of youth, he kept his own so vividly that few were conscious of his years. His face was handsome, with broad forehead and eyes set wide apart.

Careful of his appearance and rôle, he refused to betray weariness of flesh or spirit, but in public was ever brisk and confident, with vitality to spare for others. He would spend all night in his car, with a full day to follow; but the rush, the emergency calls, the cancellation of less urgent matters, the writing late into the night, were taken with an equanimity which preserved his physical frame.

Part of his charm lay in giving, apparently, his whole attention to the person who was talking to him. But it was the charm of a sensitive mind, which was evident also in his letters and speeches. With an attractive faintly raucous voice, he was a master of the short address—the lay sermon in Liverpool cathedral, the memorial tribute at St. Martin's-in-the-Fields, the graceful tribute at his hospital. He was never bitter and always ready to forget.

Many great men are a little inhuman, hard—more interested in the thing than the man. Lord Dawson felt a personal relationship towards people and was always ready to give time and trouble to anyone who came to him for help and advice. His advice was of the kind that is taken.

He had great skill in the delegation of work, and was always prepared to accept responsibility for the mistakes of a subordinate, with no further recriminations than one good honest outburst of remonstrance. He did not like the man who promised more than he could perform ("spread-eagling" he called it), and he had a horror of social snobs. Like many pleasant people, he had an endearing capacity for saying things in a slightly comic way: he advised one of his young disciples to "keep his ear to the ground and his eye on the middle page of the *Times*," and was the first to twinkle at the ludicrous picture he had evoked. He had the gift of selecting the right man; tact in the handling of others; great persuasive powers, partly through logical argument and largely through personal influence; a readiness, even in old age, to see and to be willing to accept completely new ideas. (His attitude was never "Oh no, that won't do," but always "Well, now, there's something in that. Yes, that would be well worth considering. Tell me some more about it.") He had a corresponding breadth of vision: he saw things largely and recognised the important factors in a situation. He was adaptable, and quick to see the acceptable solution of a difficulty. And he had the capacity for hard work to accomplish what he wished. We all have some of these capacities; many have several; but Lord Dawson had them all in that slightly greater degree which made the difference. This combination of undifferentiated talent—simple "ability"—would have led him to the top whatever path he had chosen.

Lord and Lady Dawson were married in 1900 and had three daughters. He was happy in his family life both in Wimpole Street and at their small house at Penn in Buckinghamshire, and many will recall with pleasure their "bachelor" dinner parties in London, with the best of company, carefully selected so as to bring together people who could contribute to the pool of medical knowledge. Lady Dawson stood by him and behind him in all his work and responsibilities, sharing his burdens. Their town house was put out of action during the blitz, and so was the neighbouring house to which he transferred his consulting-room. But he did not leave London, and he died on March 7 in Weymouth Street. A memorial service, arranged by the Royal College of Physicians and the British Medical Association, will be held at Westminster Abbey next Tuesday, March 20, at 12.30 PM.*

A PERSONAL TRIBUTE

Sir Alfred Webb-Johnson, PRCS, writes: In the passing of Lord Dawson we mourn the loss of a great man of our generation. His profession, of which he was intensely proud, took pride in him—for he stood above the common herd. Many of us were privileged to know him intimately and were happy to call him our friend. We want to recapture and to keep in memory his charming personality, for "Bertie Dawson" possessed to a remarkable degree the charm that springs from a natural grace and kindliness—a gift that is never to be gained by striving for it. It was not his published writings that gave him place, though they were important—it was just himself. It was his personality with his simple and sympathetic courtesy which won him the trust and affection of his friends and colleagues, pupils and patients.

On committees Lord Dawson was convincing and persuasive, and in quiet discussion he carried his colleagues with him even in what seemed revolutionary proposals. He was a master in the diplomatic handling of people and affairs. He often secured a measure of agreement, and achieved progress, by adopting a practicable and possible path—thus preventing an impasse, in which case there would have been nothing but the toil of a rough journey. He could appreciate opposing points of view and adopt a judicial attitude of mind.

Lord Dawson was always approachable. He was tolerant of criticism and bore no resentment, for that was impossible with his perfect courtesy. I recall that early in this war I wrote to him in strong terms protesting that a Government department was adopting a policy which in our view was absolutely wrong, and that his attitude was lacking in strength and determination. He replied

* Admission will be by ticket, and application should be made to the Secretary of the British Medical Association, BMA House, Tavistock Square, London, W.C.1.

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thanking me for my letter, and saying: "I never mind receiving frank documents. I will add to my report a summary of our advice which should reasonably correspond to your demands. There is force in what you say, and, if I fail, you must be free to push the matter into the public forum. However, I will try." He tried, and he succeeded.

When necessary none could be firmer than Lord Dawson. I recall that on the last occasion when he was well enough to join in discussions with representatives of the Government on the planning of a National Health Service the argument was frequently advanced that there was no precedent for some of the proposals of the representatives of the profession. He protested strongly against always looking for precedents in the administrative structure of such a plan, for there was no precedent for the proposal to engage the whole of a great profession in an organised public service. He made it perfectly clear that if the administrative framework and the terms and conditions of service were not such as to ensure the freedom of the profession and the efficiency of their service to the people the profession would not coöperate. The Government may yet realise the wisdom of Lord Dawson's advice that the development of a National Health Service must proceed by stages.

The great traditions of his college appealed strongly to him; but, while realising that he was one of the treasurers of a magnificent and glorious past, he always tried to mould policy in the direction of new advance as the only way to be worthy of that trust.

In consultations he was most helpful, not only in diagnosis and treatment but in raising the morale of the patient and in bringing comfort to the sickroom and to the household. The patient of the moment had his whole attention and thought. In dealing with relatives and friends, who often give doctors more trouble and anxiety than the patient, Dawson was a master. In cases of serious illness, with the issue in the balance, he would generally find some comforting phrase, but never a misleading one, in order to relieve and help the anxious relatives.

Lord Dawson earned in full measure Stevenson's tribute to the medical profession: "Generosity he had, such as is possible to those who practise an art, never to those who drive a trade; discretion, tested by a hundred secrets; tact, tried by a thousand embarrassments; and what is more important, Heraclean cheerfulness and courage. So it was that he brought air and cheer into the sickroom, and often enough, though not so often as he wished, brought healing." In the words of the *Apocrypha* Lord Dawson was "one of the leaders of the people by his counsels, and by his knowledge of learning meet for the people, wise and eloquent in his instructions.... He was one of those that have left a name behind them, that their praises might be reported."

And so farewell to one who has passed through his time with honour and distinction; one who has made great contributions to health policies, and done much for his fellow men by personal service and wise guidance—one whose influence will remain with us for many years to come.

LARGER ALLOWANCES TO FOSTER-PARENTS.—The London County Council provides for some 1100 boarded-out children, and states that many remain with their foster-parents long after they have passed beyond the care of the council. The rates of payment to foster-parents have been reviewed in the light of a new Home Office circular and increases are proposed which will include some incidental expenses, like boot repairs and haircutting, hitherto covered by separate payments. Foster-parents will receive additional grants for clothing, graded according to the age of the child; and medical and dental treatment and travelling expenses will still be paid separately.

The scales proposed for children under school age or attending elementary schools range from 11*s.* 3*d.* for those up to five to 15*s.* 3*d.* for those over fourteen. Out of these sums the foster-parents have to pay the pocket-money rising from 1*d.* a week to 6*d.* For children attending secondary schools, or junior technical or selective central schools, the rates range from 16*s.* 6*d.* for those up to fourteen to 21*s.* 6*d.* for those between sixteen and eighteen. When the child begins to earn, but before he is self-supporting, the council will subsidise his wages.

On Active Service

CASUALTIES

KILLED

Lieutenant L. C. WOODS, RAMC

DIED OF WOUNDS

Captain JOSEPH CAMPBELL SWANSON, MB CAMB., RAMC

DIED

Surgeon-Lieut. MALCOLM JOSEPH CLOW, MD CAMB., RNVR
Flight-Lieut. ERNEST ALEXANDER WALLIS, LRCPE, RAFVR

AWARDS

DSO

Major E. H. ANDERSON, RCAMC
Major R. W. BOYDEN, RCAMC

MC

Major W. J. HAY, MRCS, RAMC
Captain G. M. KILLPACK, MB LOND., RAMC
Captain G. P. MITCHELL, MB ABERD., RAMC
Captain H. N. SMITH, MRCS, RAMC
Captain J. M. WILLCOX, MB CAMB., RAMC
Lieutenant FERGUSON HARTLEY, RAMC
Lieutenant W. M. WALKER, RAMC
Captain A. D. MCKENZIE, RCAMC
Captain C. A. RICHARDSON, RCAMC
Captain K. A. C. CLARKE, RCAMC
Captain T. C. HOPKINS-HUSSON, IAMC
Captain SUKHDEVNATH ANAND, IAMC
Captain N. S. R. C. MUTHUSWAMY, IAMC
Captain H. F. OWEN, RCAMC
Captain TAYLOR STATTEN, RCAMC
Lieutenant J. G. DES BIENS, RCAMC

MENTIONED IN DESPATCHES

Surgeon Captain W. B. D. MILLER, DSC, MB GLASG., RNVR
Major RUDOLPH STUPPEL, FRCSE, RAMC (killed in action)
Captain D. B. WATSON, MB, RAMC

The first award of the VC in this war to a member of the RAMC has been made posthumously to Lance-Corporal Henry Eric Harden, an orderly attached to a Royal Marine commando troop.

MEMOIR

Major P. McL. GUNN, MC, who was accidentally killed last December, was born in 1916, the third son of Dr. George Gunn, MBE, of Wirral. Educated at Mostyn House School, Parkgate, Sedburgh School, and Edinburgh University, he graduated MB in 1939, and after holding resident appointments at the Royal Infirmary, Salford, and the Royal Hospital for Sick Children, Edinburgh, he joined the RAMC in 1940. Posted to the 9th battalion of the Rifle Brigade, he joined them near El Agheila a few days before the first retreat in Libya, and remained with them until after El Alamein, when because of their great losses they were disbanded. Gunn next joined the 1st SAS Regiment, whose exploits are still to be published. With them he once spent three months behind the enemy's lines, carrying all his medical supplies in his jeep, and caring for the many small parties working in German territory.

H. Bowburn-Lewis

Among the first troops to land in Sicily, he also made four separate landings in Italy. He won his MC at Bagnara, near Reggio, when his unit came under machine-gun and mortar fire from the high ground overlooking the town and suffered several casualties. He showed great bravery in attending to casualties under the heavy fire which swept the streets, and went forward to dress the wounded of a patrol which had advanced to attack the enemy, and had been pinned down under severe fire.

After the SAS returned Major Gunn was promoted and as medical officer in charge of the much enlarged unit he remained chiefly at the base. But he made flying visits to the various units in France, Belgium, and Holland. One of his brothers is serving in Burma, the other in Italy; his eldest brother, Lieutenant Ward Gunn, VC was killed at Sidi Rezegh with the RHA.

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Notes and News

EUROPEAN ASSOCIATION OF CLINICAL PATHOLOGISTS

AT the annual general meeting of the association on Jan. 20, with Dr. S. C. DYKE, the president, in the chair, Prof. E. M. FRAENKEL (London) discussed *Mould Allergy* in 200 allergic patients. Many more positive skin-tests to moulds had been obtained in England (53%) than on the Continent (16%) with an allergen mixture of penicillium, aspergillus, and mucor extracts; he attributed this to the damp climate which favours the growth of moulds. Allergens prepared from the six most frequent types (sporoteichon, cladosporium, penicillium, aspergillus, mucor, and monilia) gave positive skin-tests in up to 66% of the 200 patients tested with the mixtures and the individual mould allergens. Desensitisation had been successfully carried out.

Dr. E. OBERMER (Lausanne), speaking on the use of the *Clinical Laboratory in the Prevention of Disease*, described a comprehensive biochemical technique suitable for periodic medical examinations in health centres, or for individual functional surveys in patients not suffering from organic disease. For this purpose the subject must keep a record of urinary intake, output, and other relevant data for not less than 24 hours; the findings are then plotted on curves. He showed a number of curves which reflected the subject's response to physical or emotional stresses.

Dr. G. UNGAR (Paris) described experimental work on the *Bleeding-Time*, which, he said, is independent of blood coagulation and is mainly determined by the state of the capillaries. He mentioned facts pointing to an endocrine influence on the bleeding-time through the pituitary and the adrenal cortex, which appear to act on the spleen. From the adrenal cortex two factors had been isolated which when injected into animals lengthened or shortened the bleeding-time.

Dr. R. L. WORRALL (Sydney) advocated the use of intravenous ascorbic acid and adrenocortical hormone in severe cases of *Influenza*, to reduce the permeability of the pulmonary capillaries and so avoid fatal flooding of the lungs with protein-containing fluid.

A LAYMAN'S VIEW OF HOSPITALS

THE opinions of the looker-on have a traditional cachet. Mrs. Norah F. Grensted has set down in an unpretentious pamphlet[1] her impressions of the defects in our hospital system. There is little new, unfortunately, in what she says but she sets out tellingly the many flaws—the waiting-about, the anxiety left unrelieved, the changing of doctors, the fear of the unknown, the unfamiliar (even discouraging) surroundings, the lack of occupation, the needless restrictions—which hospital patients still have to face. Mrs. Grensted writes as a social worker, a patient, and the mother of children. Her humanity will appeal to those who believe that kindly dealing is the first and most important aspect of efficiency. Her views on the nursing shortage show the same liberal spirit, and she makes the important point that for those who nurse sick children experience of motherhood is an invaluable asset.

AN ADVANCE IN THE TREATMENT OF LEPROSY

A NEW method of treating leprosy is reported from Madagascar, according to the French Mission of Information. Dr. Grimès and Dr. Pierre Boiteau, who are responsible for the study, have been using a glucoside extracted from *Hydrocotylus asiatica*, an umbelliferous plant growing on the island. As far back as 1937 they had been experimenting with this plant, but at that time the chemical composition of extracts was not fully known, and therapeutic dosage was too close to toxic dosage for safety, though results were encouraging. In 1938, Boutemps, working at the leprosy laboratory at Antananarivo, isolated from the plant a new glucoside which he named "asiaticoside"; this proved to be active and much less toxic than previous preparations. It is insoluble in water, and barely soluble in alcohol, but dissolves well in pyridine. Its chemical nature is being further studied by Devanne and Razafimahery. Boiteau has succeeded in making a solution which can be given by injection, and results obtained so far are said to be remarkable. Ocular lesions are cured at once if treated before the posterior chamber is affected. Diffuse infiltrations disappear, lepromas break down and fill with fluid, burst, and afterwards scar up. Acute digital lesions and perforating ulcers heal completely. Anæsthesia and nervous lesions take a long time to improve, and recovery is equally slow in the muscles, but nevertheless many patients treated in Madagascar have already reached the stage of active reablement. Boiteau and Grimès consider that the glucoside probably acts by dissolving the waxy capsule of the lepra bacillus, thus exposing it to attack by the defensive agents of the body and by other drugs.

1. Aspects of Hospital Reform. With a foreword by Dr. Howard E. Collier. Obtainable from Mrs. N. F. Grensted, 32, Charlbury Road, Oxford.

University of Cambridge

Titles of the degrees of MB, B Chir were conferred by diploma on the following women during February: E. M. Davies, M. Farquharson, M. H. Jordan, E. M. Kingsley-Pillers, M. P. Shackle.

Royal College of Surgeons of England

Médecin-Colonel Merle d'Aubigné, conseiller technique au Ministère de la Guerre, and two other French military surgeons, Major-Commandant Toulemonds and Captain P. Lance, were welcomed at the Royal College of Surgeons on Thursday, March 8. They brought greetings from the president of the Académie de Chirurgie at Paris, and took back from the president and council of the College greetings of friendship and an expression of hope that it would soon be possible for normal relations between the two bodies to be resumed.

On Feb. 23 in Melbourne, the Duke of Gloucester, who is himself an honorary fellow of the College, presented the diploma of honorary fellowship to Sir Hugh Devine. The fellowship was conferred on Sir Hugh in 1939 when he was president of the Royal Australasian College of Surgeons.

Civil Defence Awards

The following medical men have been appointed MBE for their brave conduct in Civil Defence:

BALDEV SAHAI KAUSHAL, MB LAHORE, MRCS

Dr. Kaushal has served with the Civil Defence Service since the beginning of the war and on more than one occasion has entered confined spaces in dangerous debris in order to give aid to a casualty. When a bomb dropped in the gardens in front of his house, he sustained injuries which caused him to lose consciousness. After some minutes he recovered and it was possible to get him into an ambulance. On hearing, however, that there was a person under the debris he refused to go to hospital and attended to the casualty, giving an injection of morphine. He would not leave the site until he was assured that all casualties were cleared.

HERBERT STANLEY KNIGHT, MB LOND.

Dr. Knight has been out on duty at many incidents caused by enemy action, encouraging everyone by his coolness and cheeriness, and inspiring them by his efficiency and perseverance. Dr. Knight has always been ready to tackle any job, no matter how difficult. He has climbed up into partly demolished premises, down into debris-filled basements, and has crawled through tunnels to render first-aid and to succour the injured. At one incident, which took nearly 27 hours to clear up, Dr. Knight stood by the whole night and showed great fortitude in remaining until all the casualties were brought out.

JAMES LEITCH KEIR LAWSON, LRCPE

Dr. Lawson's courage and constant and expeditious attendance at air-raid incidents during a period of over four years has set a very high example of devotion to duty. On one occasion he was told that a woman with serious injuries had been released from under debris and was lying on the first floor of a wrecked building. The two upper floors of the premises had been shattered by blast, leaving the roof and attic floor overhanging in an unsupported position. Dr. Lawson immediately obtained a ladder and, without thought for his own safety, crawled through a small aperture in the wreckage and gave morphine injections to the casualty.

CHARLES HARVEY BATEMAN, MRCS

Houses were demolished by enemy action and people were buried in the debris. Dr. Bateman worked almost continuously in very dangerous circumstances under the wreckage, attending to trapped casualties. Although the wall above was in danger of collapsing rescuers tunnelled 12 ft. into the wreckage to reach a trapped woman crushed by the debris. Dr. Bateman remained to give her injections and looked after her until she was released.

WILLIAM THOMAS GARTHORPE BOUL, MD MANC.

Four people were trapped under the debris of houses which had been demolished by enemy action. Dr. Boul very courageously burrowed down under the wreckage to render medical attention and remained under the debris until the last casualty was extricated. During this period he sustained a man who was lying face downwards almost in the fireplace, in which there was a fire smouldering, his legs being trapped by masses of masonry and timber. Dr. Boul supported him in this position throughout the two hours taken to carry out the rescue, subject all the time to falling debris and the danger of shifting wreckage.

Dr. HUBERT O'MEARA has also been commended for brave conduct.

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University of Sheffield

Dr. H. A. Krebs has been appointed to the newly-created chair of biochemistry.

Professor Krebs, who graduated in medicine at the University of Hamburg in 1925, first went to Sheffield from a post at Cambridge nine years ago and, as lecturer, founded a school of biochemical research which has received support from the Medical Research Council and the Rockefeller Foundation of New York. He has taken an active share in organising nutritional studies for the Government during the war. Dr. Krebs obtained his MA Camb. in 1934.

Mr. A. E. Bender has been appointed research biochemist in the department of pathology to work in association with the Sheffield radium centre.

University of London

Mrs. Mary Stocks, principal of Westfield College, is standing as an independent progressive candidate for London University at the next general election.

Society of Apothecaries of London

On Tuesday, March 27, at 4 PM, at the society's hall, Black Friars Lane, London, EC4, Prof. E. C. Dodds, FRS, will speak on ancient apothecaries and modern biochemists.

Royal Society of Medicine

On Friday, March 23, at 3 PM, at the section of epidemiology and state medicine, Sir Weldon Dalrymple-Champneys will speak on public health in India.

Mental After Care Association

The annual meeting is to be held at Burlington House, Piccadilly, London, W1, on Friday, March 23, at 2.45 PM, when the speakers will include Colonel Y. Kneeland, USAMC, Brigadier G. W. B. James, and Colonel Henry Yellowlees.

Royal Society of Tropical Medicine and Hygiene

A laboratory meeting will be held at the Royal Army Medical College, Millbank, London, SW1, on Thursday, March 15, at 3 PM.

Scholarships in the Colonial Service

The Nuffield Foundation is to provide £30,000 for scholarships to enable Dominion or Colonial members of the Colonial Service now in subordinate ranks to qualify for promotion, particularly by obtaining qualifications in medicine or biological subjects. The scholarships will be open to men and women of any race and will begin in the academic year 1945–46; they will be granted on the recommendation of the Colonial Office and Colonial Governments, and will be tenable in any university or similar institution in the Empire.

London County Council

The following medical men and women have been appointed to the standing committees of the council:

Education committee: Dr. J. A. Gillison, Dame Barrie Lambert, and Dr. E. P. Hulbert.*
Establishment committee: Mr. Somerville Hastings.
Finance committee: Mr. Somerville Hastings.
Hospital, and Medical Services committee: Mr. Somerville Hastings, Dame Barrie Lambert, Miss Esther Rickards, Dr. E. P. Hulbert,* and Dr. Stark Murray.*
Housing and Public Health committee: Dr. S. W. Jeger.
Mental Hospitals committee: Dame Barrie Lambert and Dr. Doris Odlum.*
Supplies committee: Dame Barrie Lambert.
Special Committee on Staff (Appeals): Dame Barrie Lambert.

* Coöpted members.

Dental Units for the Navy

On behalf of the joint war organisation of the Red Cross and the St. John Ambulance, Field Marshal Sir Philip Chetwode, chairman of the executive committee, has presented the Admiralty with two dental units. The gift was made at the Royal College of Surgeons on March 8, in the presence of Sir Alfred Webb-Johnson and the vice-presidents and members of council. Sir Alfred noted that a high proportion of British dental surgeons are licentiates of the college, which is the home of the finest odontological museum in the world. He pointed out that the units can only be used to their full advantage if they have an adequate staff not only of dental surgeons but of technical assistants who will set the dental surgeons free for operating and research work. The units were accepted for the Admiralty by Surgeon Vice-Admiral Sir Sheldon Dudley, medical director-general of the Royal Navy. The units, which have cost about £1200 each, have been equipped with chair, drill, and engine by the Admiralty.

Scientific Film Association

The following films will be shown at 1, Wimpole Street, London, W1, on Wednesday, March 28, at 5.30, and again at 8 PM: The Nose Has It, The Action of Cilia and the Effect of Drugs on their Activity, Open Drop Ether, Unwanted Guests, and Conquest of a Germ. Tickets from the honorary secretary of the medical committee, Dr. S. J. Reynolds, 14, Hopton Road, London, SW16.

MOSQUITO REPELLANT.—Ships going to tropical African ports and the East Indies are now to carry a supply of dimethyl phthalate to be issued to the crew as a protection against mosquitoes when the vessel is in a malarious area. The instructions are to apply a few drops to the exposed parts of the body, avoiding areas round the eyes and mouth, and to the clothing if the mosquitoes are biting through it. One application lasts 4 hours.

Appointments

CAMPBELL, IVOR, LRCPE: medical referee for the sheriff-court district of Oban.
JARRETT, EDWARD, MB CAMB., MRCP: medical registrar at St. Mary's Hospital, London, W2.
MACDONALD, D. S., MB ABERD.: examining factory surgeon for Westbury, Wilts.
MENZIES, A. G. H., MB LPOOL: RSO at Montagu Hospital, Mexborough.
MYLES, DAVID, MB ST. AND.: medical referee for Forfar sheriff-court district.

Births, Marriages, and Deaths

BIRTHS

ADAMS.—On March 5, at Wigan, the wife of Surgeon Lieutenant J. A. W. Adams, RNVR—a daughter.
BAILEY.—On March 8, the wife of Dr. E. H. Bailey, of Woodford Green—a daughter.
FRANKLIN.—On March 6, at Gloucester, the wife of Dr. Hugh Franklin—a son.
GALLEY.—On March 6, in London, the wife of Dr. A. H. Galley—a son.
JEFFREYS.—On March 1, at Cardiff, the wife of Dr. D. M. Jeffreys—a daughter.
KELSEY.—On March 4, at Guildford, the wife of Dr. Denys Kelsey—a son.
LAKE.—On March 6, at Oswestry, to Dr. Lorna Lake (née Meredith Davies), wife of Lieutenant Peter Lake, RA—a daughter.
MACFIE.—On March 3, at Glasgow, the wife of Captain W. G. Macfie, RAMC—a daughter.
RHODES.—On March 8, at Woking, the wife of Captain B. W. Rhodes, RAMC—a son.
TRONCHIN-JAMES.—On March 7, in London, the wife of Flight-Lieutenant R. N. Tronchin-James, MRCS, RAF—a son.
WHITAKER.—On March 9, the wife of Surgeon Lieutenant Allen Whitaker, RNVR, of Guildford—a daughter.
WINGFIELD.—On March 8, in London, the wife of Dr. Alec Wingfield—a daughter.

MARRIAGES

ALMOND—FORSTER.—On March 6, at Frimley, John MacCormac Almond, major RAMC, to Joy Forster Forster, third officer WRNS.
BOON—MILLAR.—On March 3, at Golders Green, Frank Boon, captain RAMC, to Judith Jessica Millar.
DA FANO—DYER.—On March 1, in London, Matthew Da Fano, MB, captain RAMC, to Mina Iris Anne Dyer, ATS Signals.
DODD—VALE.—On March 3, at Deal, John A. Dodd to Brenda Vale, MB.
GIBSON—FAIRWEATHER.—On March 3, at Ipswich, Ronald Gibson, captain RAMC, to Thelma Pauline Fairweather.
PHILPOTT—QUARMBY.—On March 3, at Welwyn Garden City, Maurice George Philpott, MB, to Constance Quarmby.
THOMPSON—BACKSTEDT.—On Feb. 7, at Brussels, John Thompson, captain RAMC, of Manchester, to Doreen Backstedt, sister QAIMNS/R.
WATTS—LYNCH.—On Feb. 12, at Northampton, John Aubrey Ewart Watts, FRCSE, to Mary Elizabeth Maureen Lynch, SRN.

DEATHS

BETTS.—On March 29, at Crowborough, William Andrew Betts, CMG, MD EDIN. and CAPE, FRCSE, aged 78.
BRODRICK.—On March 9, at Widemouth Bay, near Bude, Charles Cumberland Brodrick, LRCPE, aged 88.
CARTE.—On March 6, in London, Geoffrey Williams Carte, BM OXFD, FRCS, aged 60.
CHAPPLE.—On March 8, in London, Harold Chapple, M CHIR. CAMB., B SC. ADELAIDE, FRCS, FRCOG.
HOWELL.—On March 4, at Cheltenham, John Howell, CBE, MB LOND., FRCS, aged 73.
SANDERSON.—On March 4, at Cleland, Lanarkshire, Iain Sanderson, MB EDIN., late Colonial Medical Service, Tanganyika Territory.
SCARLYN WILSON.—On March 4, at Camberley, Archibald Scarlyn Wilson, MA, MB CAMB., DPH, of St. Leonards-on-Sea.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

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THE HUNTERIAN MUSEUM

YESTERDAY AND TOMORROW*

G. GREY TURNER

M S, D CH DUBH., LL D GLASG., F R C S, F R A C S, F A C S

PROFESSOR OF SURGERY IN THE UNIVERSITY OF LONDON, AT THE BRITISH POSTGRADUATE MEDICAL SCHOOL

JOHN HUNTER was not the first person to create a museum, nor even the first to collect medical preparations. The museum of the Royal Society was started in 1681, and the Ashmolean in Oxford in 1683; and there were others earlier on the Continent. John Hunter's teachers no doubt had their own specimens, and at St. Bartholomew's Hospital in 1726 a room was prepared as a "repository for anatomical or chirurgical preparations." But undoubtedly the great stimulus was William Hunter's collection, which was well started before John made that notable journey from Scotland to join his brother as assistant in the dissecting-room.

John was the youngest of ten children and was born, when his father was 68, at Long Calderwood, the family property in Lanarkshire in the south of Scotland. His early years were said to have been wasted in idleness, and it was constantly held against him that at 17 he could neither read nor write and that part of his youth was spent in a carpenter's shop. But in after life he spoke of those early years spent around his home in the country as of special value in cultivating the powers of observation. "I wanted to know about the clouds and the grasses and why the leaves changed colour in the autumn. I watched the ants, bees, birds, tadpoles, and cadis worms; I pestered people with questions about what nobody knew or cared anything about." Doubtless he had much time to wander about and observe and think; but I cannot believe that he was otherwise entirely unoccupied. In those days in Scotland everybody had to work for their daily bread, and I think we may be sure that he not only helped his mother but also his father about the business of their holding.

The life of the farmyard, as of the countryside, must have been thought-provoking. Crop-bound fowls, pigeon-lofts infested with contagious tumours, lambs with grass-ill, or "sturdy" sheep—all would provide fascinating problems. The accidents to which stock are liable would arouse keen interest in the surgery of injuries and repair, and certainly teach a reverence for the healing powers of Nature. The vagaries of swallowed foreign bodies would arrest attention. What lad could ever forget seeing the intestine of a young horse trailing on the grass after castration, and what inquiries it might stimulate years afterwards in connexion with the anatomy of congenital hernia. The phenomena of reproduction, abortion, and obstetric emergencies of all sorts obtrude themselves wherever stock-breeding is part of a hard-won livelihood, and it is interesting to recall that in later life Hunter envisaged artificial insemination. Family illness and episodes of the crises of human fate would often be discussed, and in the Hunter household death was all too familiar.

When John was about 18 it was felt that something should be done to help him to make a career and he was sent to Glasgow to help in the workshop of his brother-in-law, a cabinet-maker. Some have rather looked askance at this period in the joiner's shop and have suggested that he might have been better employed. With this I would join issue, for I believe that work with tools, and especially the clean precise tools that joiners employ, is an excellent education for anyone destined to use his hands for his life's work.

When three years later he returned from Glasgow wanting an outlet for his activities, William was sending letters home describing the fascination of his work in London and extolling the opportunities it provided. Probably little persuasion was needed to make John undertake that journey south in search of fame and fortune. Once in London, William's influence and example must have had a very powerful effect. The elder brother was not only a very successful teacher of anatomy but was a fashionable practitioner. Withal he had a passion for collecting. He knew the art of the *preparateur* and his preparations were then regarded as among the best in London.

INCEPTION AND GROWTH OF JOHN'S COLLECTION

It is often wondered how Hunter secured his specimens in his early days; for it has been stated that while he was working as demonstrator for his brother any preparations he put up were placed in his brother's museum. But probably he would remove some portions that were of special interest and take them to his lodgings to dissect in private. Many of us in the same position abstracted portions which were afterwards prepared in the dead of night, perhaps in the family kitchen. In these days, when the operating-theatres so constantly supply the needs of our museums, it is perhaps forgotten what a wealth of pathological conditions are unearthed in the dissecting-room. In comparative anatomy his great source of supply were the animals that died in the menagerie then kept in the Tower. He never lost a chance of acquiring anything that would make a suitable preparation. Some were presents from friends. Others were secured by purchase, and we know in connexion with the skeleton of the Irish giant to what length of monetary impropriety he was prepared to go rather than lose some specimen on which he had set his heart.

HIS METHOD OF WORK

The actual labour of making his museum must have been colossal, and there can be no doubt that the major part of it fell on himself. Just think of the dissections, the macerations, the injections, and the display of the pathological material. Then there were the jars to select, and the specimens to be suspended or otherwise displayed, and the tops to be fixed. There were no ground tops to be cemented on but each jar had to be covered with pig's bladder or parchment which had to be securely tied. And after drying there was the outer cover of thin sheet lead to be fitted, secured, painted, and probably varnished. Then there was always the recording to be done, descriptions to be written, and labels to be fixed—work in which he was not always quite as careful as he might have been, though he was always making notes and no-one can say he was not systematic. There is evidence that he was concerned with all these tasks.

Think again of what it meant to be engaged in this work almost every day for 30 years. In his Hunterian oration the late Mr. Hey Groves suggested that during all this time Hunter added one specimen a day to his collection. His routine was to rise at 5 AM or earlier in summer, and 6 AM in the winter, and go at once to his dissecting-room where he stayed until breakfast-time. All his dissections and museum work were done in his own houses, for there were no laboratories or workrooms kept for him at the hospital and he had to provide all that he required and had to supervise all that went on. At each of his homes arrangements were made so that he could fulfil his self-imposed tasks (fig. 1).

The methods of specimen-preserving used in those days are worth considering.

There were the ordinary dissections, some of them very delicate and some of great size. Many of these were mounted in spirit; but because of the difficulty of securing large enough jars and spirit some were prepared by the dry method. Hunter's original collection contained over 500 of this type. It was a tedious method for the specimen had to be very carefully cleaned, and then packed or distended with air. They were then probably painted with an arsenical preparation and hung up until dry. Finally they were carefully varnished and revarnished and as a rule mounted in jars. Specimens made in this way will often last many years (fig. 2) and there are still some Hunterian preparations of this kind in good condition.

Then there was injection, a method in which he excelled and on which he has left directions; but these do not appear to have conveyed the secret of the art to those who have tried to follow in his footsteps.

The dry bone specimens had all been macerated or boiled—both slow processes to get the best results. There were also the calculi, the plants, foreign bodies, as well as the fossils of which Hunter left so large a collection.

A great deal of his work must have been done by candle-light. Heating too must have been a difficulty, for there

* Extracts from the Hunterian oration delivered before the Royal College of Surgeons of England on Feb. 14, 1944.

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was nothing but open grates, and when there was no fire a flint and steel with tinderbox would be necessary to get a light. For his literary labours there were only quill pens, as shown in Reynolds's portrait. His handwriting is good and legible, but occupies a considerable amount of space, and we know that during those very full evening hours he filled an enormous number of notebooks. During his last years he dictated a good deal to an amanuensis, but there is no evidence that any sort of shorthand was employed. The manuscripts taken away from the Castle Street house to suffer so sad a fate at the hands of his brother-in-law Everard Home were said to fill a coach. Fortunately for us there were also many which were not destroyed.

Had Hunter done nothing more than care for his museum, his pupils, his lectures, and his writings, and supervise his amanuenses and artist, he would have been very busy. But these were really only sidelines, for he had a very large practice. His professional work commenced after breakfast when he saw patients at home, and it is said that those waiting were so numerous that they often invaded his wife's drawing-room. At a fixed hour he left home in his coach to make outside visits and for hospital practice, and he never delayed his departure even if persons of importance were still waiting to be seen. He did not return until 4 PM which was then the usual dinner hour. After dinner he commonly slept for an hour on a couch in what was called the afternoon bedroom, and then began what must have been some of the most strenuous work of the day, letter-writing, case-recording, revision, the description of his dissections, and the literary works which eventually gave him lasting fame. Assuredly he scorned delights, and no-one has ever lived more laborious days.

THE COLLECTION AFTER HUNTER'S DEATH

In the latter part of his life the question of making provision for his family became a gnawing anxiety to Hunter. For years his practice had been the best in London and had brought him a large income—as large in relative value as any London surgeon has ever enjoyed. But the expenses of his establishments and of his museum took every penny. Clift, that faithful man, kept a list of those employed in the practice and in care of the collections and stated that, exclusive of the house pupils who paid for their own board, there were never less than 50 persons fed and provided for at Hunter's expense daily.

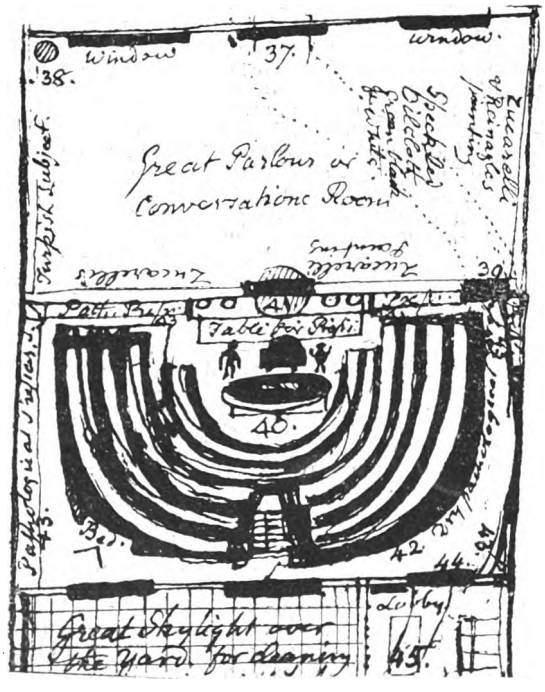

Fig. 1—From Clift's plan of No. 28, Leicester Square, the home of John Hunter, as it was in 1792. The plan shows the great parlour where medical meetings were held, and the lecture theatre with accommodation for both wet and dry preparations.

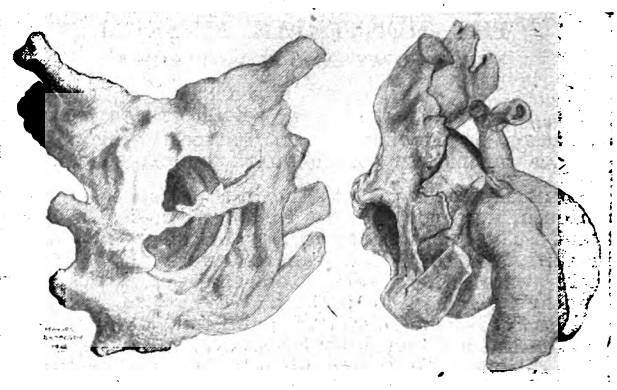

Fig. 2—Aortic aneurysm eroding and perforating sternum. Dried preparation still well preserved after about 80 years. (Durham University College of Medicine, 147/12).

He must have known that his realisable assets, as ordinarily understood, would do little more than pay his debts, and he probably regarded his museum as his one great asset. By his will it was to be offered to the British Government on reasonable terms, sold in one lot to some foreign government, or otherwise disposed of as his executors decided. But at the time of his death our Government were once more involved in a Continental war and they were not interested in the offer. And even the leaders of the scientific world do not seem to have realised the value of the collections, which they probably regarded as only wonderful curiosities. So the preparations on which he had spent £70,000 of his hard-earned money were merely stored in the house in Castle Street. Clift, his faithful pupil, acted as custodian on the miserable pittance of 7*s.* a week; and in addition the trustees made a small allowance for spirit to replenish the specimen jars. At the end of Clift's long vigil the Government were again approached and decided to offer the executors £15,000 for the whole, which sum was voted by Parliament on June 13, 1799, and was accepted. It may seem a small amount for a collection of such scientific value, but at all times medical museums have proved very bad investments.

Having made the purchase the Government had to find some means of getting the collections looked after. Eventually their custody was undertaken by the Incorporation of Surgeons—soon to become the Royal College of Surgeons of London and later of England. After removal of the collection to Lincoln's Inn Fields in 1806 the next thing was to find someone who could at least help to put it in order. Here at last was Clift's opportunity, and he was appointed as conservator at £100 a year, which after 7*s.* a week seemed a fortune! Then it was necessary to set about building a suitable museum for which fortunately there was ample accommodation on the Lincoln's Inn Fields site. The museum was estimated to cost something like £12,000 and a further grant of this amount was made by the Government; but it required a supplement of some £21,000 from college funds to provide a worthy setting.

In 1813 the building was opened and the collections were moved in. At first there was a great deal of muddle and difficulty about getting the specimens arranged and catalogued, and in 1826 the college was only too glad to find Richard Owen, a young surgeon who had established himself nearby, and was waiting for practice. When next year Owen took over the duties of assistant to the conservator at least 3970 specimens had to be examined and described, and for this he had to obtain and examine fresh material and to make some 200 special dissections. Owen was always a comparative anatomist and zoologist, and his energies were almost entirely given to that branch of the collections. By 1830 or thereabout the college found that the accommodation was much too limited, and further additions were built. When Rickman Godlee delivered the oration in 1910 he stated that up to that time the college had spent £500,000 on the collection.

The physiological collection was fortunate in having Owen to act as conservator, but the pathological collec-

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tion was practically without any special attention at that time. The first effective pathological catalogue was undertaken by Stanley, one of the surgeons at Bart's, with the assistance of James Paget, then a man of 27 struggling to find a place for himself on the staff of that hospital. When Paget undertook the work in 1842 he estimated that it would occupy him for two hours a day for two years, but actually it was seven years before the catalogue was complete. The preparations to be catalogued amounted to 1709 Hunterian and 1808 subsequently added. In 1878 a second edition was begun. In this Paget had the able assistance of J. F. Goodhart and Alban Doran, but none the less he examined every specimen and compared its description with its appearances.

Day in day out, the collections increased and there was always the problem of which specimens to exhibit, which to keep in store, and which to reject. In all great museums the difficulty is to preserve a proper balance and to direct development along the best lines, and hitherto this has been the task of the conservator.

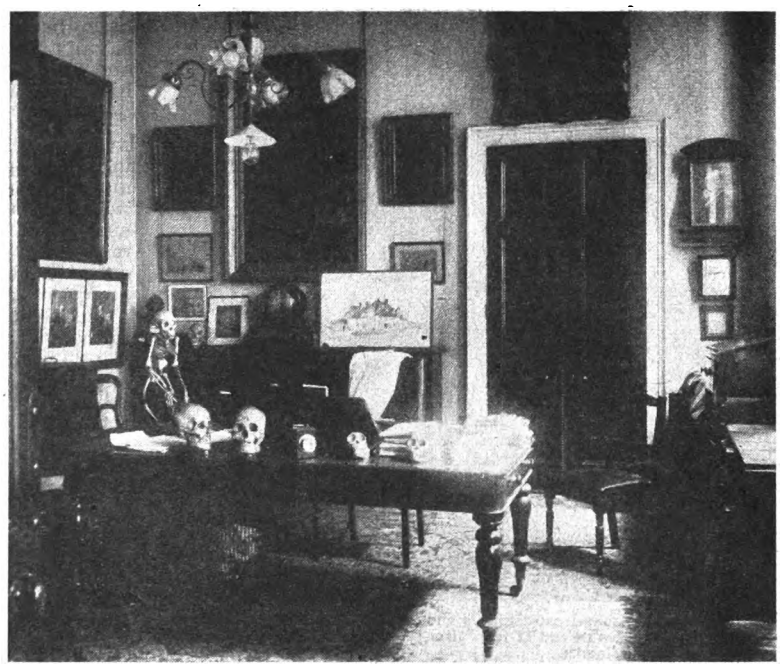

Fig. 4—The Conservator's room in the time of Sir Arthur Keith. Photograph by "George" May, 1933.

THE MUSEUM IN ITS HEYDAY

That great conservator, Arthur Keith, spent 26 of the best years of his life (1908–34) in nursing the collections (figs. 3 and 4). Many of us have occasion to remember the museum in those days with gratitude, though not always for the same reason.

According to Owen, the marvellous collections in comparative anatomy and osteology, and the physiological series, were the fundamental part of the museum, and it was the part that appealed to generations of scientific workers from all over the world and brought the college such renown. As A. J. E. Cave has said, these collections provided material for the solution of fundamental problems incapable of experimental settlement.

But I think everyone regarded the museum as the repository of all that was best and most important appertaining to anatomy, pathology, and surgery, both practical and historical. My earliest recollections are largely associated with the wonderful dissections and other anatomical preparations, of which there were nearly 500. At no time in the world's history has the art of the prosector produced more beautiful preparations, and this was the standard collection for anatomists.

Fig. 3—Sir Arthur Keith, Conservator 1908–34.

The great majority of these masterpieces were the work of William Pearson (fig. 5), who started in the college in 1856 when a lad of 15. Pearson worked under five curators until 1914, when at the age of 73 he retired because of failing health; but he lived nine years longer, dying in 1925 at the age of 82. He was the last of the line that served the college faithfully and wholeheartedly. In 1804 his grandfather was engaged as a porter by William Clift, and learned from Clift the museum technique that Clift himself had learned from Hunter. This information he passed on to his son Thomas, who in turn handed the torch to William. The combined services of this family totalled 153 years.

The next outstanding feature of the museum was that wonderful collection illustrating the principles of pathology as apart from regional pathology. It was there that the Hunterian tradition was enshrined. Such a collection had been envisaged by Hunter and some of his preparations were specially made for this purpose. The finished product as we knew it was due to S. G. Shattock, the shy retiring Shattock, who so well appreciated the fundamental principles that run through the structure of disease in the whole animal kingdom.

But even among those who cherished our museum for some special purpose there were few who realised its magnitude, its completeness, or the underlying idea. Few there were who knew what a storehouse of treasure reposed within our walls.

THE DISASTER AND AFTER

On the night of May 10, 1941, the college museum was struck by a heavy high-explosive bomb and by incendiaries. The greater part of the museum, and some parts of the college, were destroyed, and about two-thirds of our collections vanished in the conflagration. The story of the steps which had been taken to guard against such a tragedy, the details of the disaster, and the steps taken to salvage and care for what remained of our treasures has been admirably told by Prof. Cave, the assistant conservator, in the scientific reports of the college for 1939–40 and 1940–41. It is a sad chapter in college affairs. But clearly our duty is to look to the future hopefully and to consider plans as well as ways and means for its restoration.

Fig. 5—William Pearson, prosector to the College of Surgeons for nearly 60 years. From a painting by Onslow Ford.

THE FUTURE

The disaster not only imposed a greater responsibility but provided an opportunity for some reorientation, and it was necessary to decide in what direction that should be. After some months the museum committee were able to present to council a plan for the restoration together with many ideas as to future developments. The museum will be reborn in circumstances different from those existing when it first came into being over 130 years ago. Then there were no museums devoted to anatomy and pathology in this country, and only one or two London hospitals had a few preparations for the use of their pupils. Now all medical schools up and down the country have museums, and other institutions are in a position to carry out many of the activities

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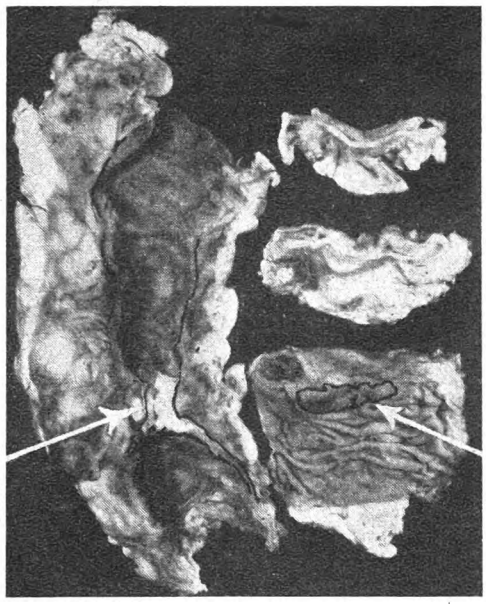

Fig. 6—Specimens from a patient alive and well 25 years after conservative resection of the rectum and 12 years after removal of the hepatic flexure, in both cases for carcinoma.

previously shouldered by the college in the field of zoology and natural history. The council and the Hunterian trustees have therefore agreed that the new museum shall be built up around the surviving collections to illustrate the development, the structure, and the functions of man, together with the accidents and diseases to which he may be a victim, with such reference to the animal kingdom as may help to elucidate the problems involved.

One of the first questions before the committee was the disposal of the surviving Hunterian preparations. The first inclination was that they should be kept together as a precious relic and memorial. More mature reflection convinced us that this would not be in keeping with the Hunterian tradition, and that it would be much better to have them allocated each in their proper sections of the general collection where they might act as a leaven and stimulus. But an idea very much in my mind is the suggestion that when the specimens can be safely returned to the college an exhibition of the whole surviving Hunterian collection should be set up in one of the rooms together with all the existing relics of Hunter which we can get together. This should be attractively set out according to the original plan and should be on view for several months so that those interested may have the rare privilege of seeing the collection as the great man envisaged it.

Among many who have talked about the restoration of the museum there are not a few who have a dread that the new museum will be cluttered with animal skeletons. There are some who have no use for the wonders exhibited by the bony framework of the elephant, the giraffe, or the whale, and no veneration for extinct monsters like the Irish elk, the megatherium, or the armadillo. They may be astonished to hear that it was never the policy of the college to collect taxonomic exhibits; but if some skeleton or part of a skeleton is necessary to demonstrate some special feature in comparative anatomy which leads up to the better comprehension of the structure and function of man, then of course it must be preserved and exhibited. The same general principle will apply to the soft parts of animals, however large or however minute. Just fancy the interest of comparing the œsophagus of the giraffe with its insignificant counterpart in man! Perchance the secret of achalasia may be disclosed in the study of its neuromuscular mechanism.

It is the intention to keep the museum as an up-to-date collection by replacing deteriorated specimens and by constantly adding better ones. Only the very best obtainable should be found on our shelves. But there is another point, and that is the question of the history and the after-history of the cases from which specimens have been obtained. Many a poor-looking specimen is valuable because of the interest of its clinical history, and many another increases in value as the long after-history of the case adds to its interest and importance.

An illustration of the value of keeping the actual specimens was recently provided by a review of some of my old cases in which operations had been carried out for removal of malignant disease of the rectum. Four patients especially were alive and well from 18 to 32 years after the operation, and the specimens allowed us to re-examine them critically and review once again the conditions of growth and to make an estimate of the grading which placed them all in the favourable groups of Broders's classification.

Fig. 6 illustrates the specimen I preserved after first performing a conservative excision of the rectum for cancer. For 25 years the patient, who remains well, has been able to appreciate the priceless gift of a continent anus. And because of the preservation of the specimen all doubts about the nature of the original growth have been set at rest by repeated histological examinations. That particular case is of further interest because 13 years ago I also excised a carcinoma of the hepatic flexure.

There is a tendency among surgeons to say, or at least to fear, that most cartilaginous tumours or fibrous tumours connected with bone are really malignant, as shown by the subsequent history of the patients on whom radical operations have been carried out. The woman from whom the left half of the mandible was removed for such a tumour (fig. 7) was alive and free from recurrence 31 years later, and a further histological examination confirmed the original report of fibroma with much œdema. (See also fig. 8.)

Fig. 7—Excision of jaw and of rectum, in both cases for carcinoma. The patient died at 87 without recurrence 24 years after operation on jaw and 18 after removal of rectum. (Specimen of jaw in left hand and of rectum in right.)

Another idea I want to mention is the value of special but changing exhibits. The restored museum should possess a large demonstration room where special exhibits could be put up from time to time and kept on view for a month or more. The anatomy of approach is somewhat of a new idea, and is intended to display the anatomy of operative incisions.

How often has the novitiate wondered exactly what are the structures encountered and to be divided or thrust aside in carrying out the exposure of the kidney, excision of the rectum, or the exposure of the gasserian ganglion. For each operation a series of special dissections would have to be made and alternative routes of approach would have to be illustrated. I am convinced of the value of such a plan and am most interested to find that it was employed by James Douglas who died in 1742 and whose name is given to the peritoneal pouch. Douglas realised the importance of anatomical knowledge in the practice of surgery and had in his house a complete collection of preparations showing every possible surgical method of reaching the interior of the bladder and the advantages and inconvenience of each method so far as these depended on the structure of the parts.

The section of general pathology should be restored in its entirety and there may be directions in which it could usefully be extended. The old museum contained the most remarkable collection of all sorts of calculi, about a thousand in number, which were classed mostly according to the parts of the body in which they were found. In the future museum considerations of the formation of "calculus disease" might form a thought-provoking section.

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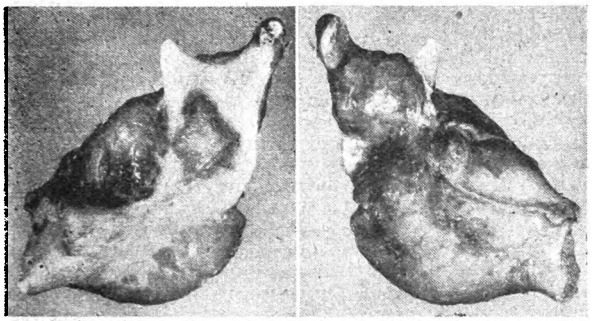

Fig. 8—Soft fibroma involving left half of the mandible. It was excised in a woman of 45. There was no recurrence and the patient remains well 31 years after operation.

Then there is the idea of illustrative group exhibits in which the ravages of any one disease are shown together irrespective of the regions of the body involved. A medicolegal collection is very badly needed, for there is none of any moment in a public museum. I was much impressed with such a collection which I visited in Buenos Aires where most beautiful wax models were freely used to amplify the exhibits.

Gynæcology and obstetrics were always well represented in our museum, and there ought to be no difficulty in rebuilding these collections and in making them second to none. The odontological collection was fortunately spared. Under the devoted guidance of its honorary curator, Sir Frank Colyer, this branch of surgery, which originally owed so much to Hunter, was worthily represented. Each of the special senses must have sections, as in the past. But this must not exclude certain conditions being included in the section of general pathology or elsewhere in the museum if some principle can thereby be the better illustrated.

In view of the well-directed activities of the Wellcome Foundation I think we might properly restrict our historical collection to relics of Hunter and his immediate associates. A large part of our collection of surgical instruments has survived, and might well form the nucleus of an exhibit to illustrate their evolution and development. Sections for venereal disease, anæsthesia, blood-transfusion, and wound treatment will certainly prove useful and interesting. Nor should X rays be excluded from such a museum as we have in mind, and I envisage at least a standard collection of the very best films.

The after-results of operations might form an increasingly fascinating exhibit (fig. 9). Similarly the results of experimental surgery should be recorded by specimens. Further, in order that we may help serious workers to extend knowledge it will be necessary to have a large amount of store material not merely tucked away but easily accessible and properly catalogued or indexed (fig. 10). Facilities should be provided for its close examination even if dissection is necessary. I also have in mind proper study rooms, where those engaged in a particular piece of work can keep their specimens together and can work on them without necessarily having to reassemble their material each day. For some years now there has been much talk in the profession of research, but this has usually been in terms of laboratory work and usually animal experiments. Many people forget how much research is waiting to be done in other directions, and there is certainly a great deal that might be carried out in a well-equipped museum. Especially we should provide for the very many keen young surgeons who are working in and about London: convenience and proximity will not in themselves initiate investigation, but they will do much to encourage it.

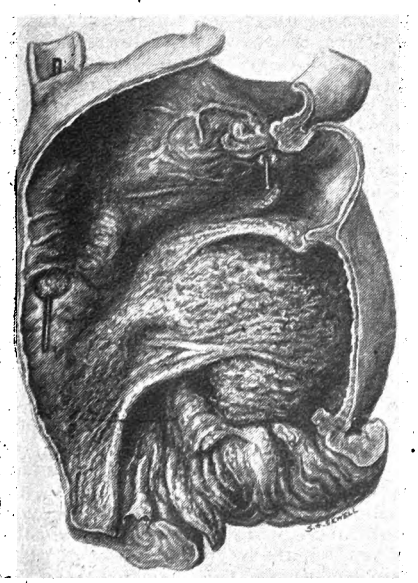

Fig. 9—The rectum, into which both ureters were transplanted 3½ years before. The patient, a boy of 10 with total epispadias, died from intestinal obstruction due to mesenteric tuberculosis. Until the onset of the fatal illness he was well, with good rectal function and control.

We should aim at making our collections the most famous repository in the world; but we must not make the mistake of supposing that other museums have stood still, and we should have information as to what may be going on elsewhere, so that inquirers may be helped by reference to the proper quarter. Here a museum bureau would be very useful. Among other functions this should supply information about collections in other museums in the Empire, in time perhaps throughout the world.

There is so much in prospect that I would like to think that more members of the profession would choose to adopt museum work as a career. Adequate facilities for making use of the particular part of the collections which might be under their care, and for taking part in general scientific activities, should be a sufficient inducement to men of a certain type of mind to devote their lives to such an occupation even if the monetary return was less than in other spheres of professional activity. Perhaps the revival of studentships might be a help and such might be endowed. When we think on these matters it is usual to have in mind the younger members of the profession, but we ought to remember the more senior members who have often been so helpful in the past and who might be glad to follow the tradition and to continue working for the collections for many years after their active work in hospitals or medical schools has come to an end.

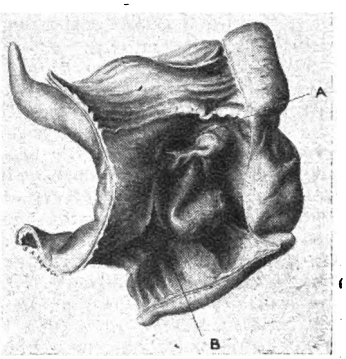

Fig. 10—A rare anomaly of small intestine: Meckel's diverticulum with similar condition in lumen of bowel. A, entrance to internal diverticulum. B, entrance to Meckel's diverticulum.

It may be that the calls on the college for the restoration of the museum and its subsequent upkeep at a very high standard will require a very much larger income; and the time may come when we must expect our fellows, perhaps even our members, to make some sort of annual payment to our funds.

CONCLUSION

And now a word to my younger hearers who are by far the most important members of this audience.

There are few privileges left when the years hold so much more in retrospect than in prospect; but one great gift remains—the privilege of encouraging those whose best years lie ahead. To restore this museum will be a great exploit and a great joy. But it cannot be done without your help, which will be greatly valued by succeeding generations.

You must never forget that what enabled Hunter to put his ideas into practice was his wonderful capacity for work. That was the master word in his career.

BEQUEST TO THE LONDON HOSPITAL.—Miss M. G. Davies has left £10,000 to the hospital in memory of her father, Thomas Alexander Davies, and of her brother, Ivor Theophilus Davies, "for the purpose of inculcating into the minds of young and old the advantages of following sound rules of hygiene, including simple healthy diet, exercise, fresh air, and cleanliness, together with cheerful Christian religious instruction." A department of social and preventive medicine has lately been set up at the hospital.

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PSYCHIATRIC CASUALTIES
AMONG OFFICERS AND MEN FROM NORMANDY
DISTRIBUTION OF ÆTIOLOGICAL FACTORS

EMANUEL MILLER, M.A. CAMB., M.R.C.P., D.P.M.
LIEUT.-COLONEL R.A.M.C.

To the uncritical observer the reasons for breakdown as a result of the stress of war should present no distinctive features as between men and officers. It is the aim of this paper to show that there are important distinctions which need scrutiny for the purpose of tightening up selection techniques and refining methods of treatment and disposal.

Even before selection boards were instituted it was clear to intuitive judges of men that certain qualities of mind and capacities for action were necessary if a man was to fill the officer rôle, for even admitting that a man is likely to assume leadership in virtue of his special technical equipment for a given arm, there are capacities which will cut across these considerations. The genus officer is not determined by some inborn quality which gives a man membership of an elite but by the possession of a group of gifts which are actuated in a particular situation. Prima facie the officers who landed with their men on the Normandy beaches were a selected body collected either by the old method of interviewing or by the later techniques established by War Office selection boards. Nevertheless the ultimate test was war itself, for until tried in the fire the quality of the metal cannot be fully known.

The ordinary soldier cannot be defined merely as one who does not possess officer quality (i.e., technical equipment to lead and moral equipment to inspire) but as a man who has not been selected so far, and in consequence must remain for the time being in the lower level of the military heirarchy and therefore subject to the emotional imperatives of that level in the military field. The officer is one who while isolated is yet responsible in a most intimate way for the conduct of an operation however small, and bears all responsibility which this operation may entail; for at any moment the smallest operation may be critical to his men and to the larger consequences of a campaign.

The object of this contribution is to study from collected data the differential way in which the capacities and handicaps of men and officers respectively can withstand the impact of military necessities and the conditions of active warfare. By analysis of officer breakdowns consequent on the Normandy campaign it was possible, by subjecting their histories to the same technique as those of other ranks, to estimate in some degree the weight of ætiological factors in the two groups of men.

Within reasonable limits the age-groups were the same, ranging from just under 21 to 35 years, and length of service was similarly distributed throughout the two series. For each group the number who had had pre-war experience as serving soldiers or officers was the same. An almost equal number of officers and men had previously seen active service in other theatres of war.

With regard to the physical strains of battle in the first 25 days after the landing, the privations experienced must be regarded as of equal intensity in both groups. The irreducible variables were therefore: (1) the type of precipitating factors; and (2) predispositional factors (table I).

PRECIPITATING FACTORS

The type of weapon experience and the immediate objective effects of enemy fire appear to have been the same in officers and men, although the men seem to have been more conscious of the harassing effects of mortar and shell fire. Officers, on the other hand, being perhaps on the whole more introspective and more conscious of the technique of battle, were more reserved in their statements regarding the unpleasant character of enemy weapons. They tended to analyse their effects on a more technical level without speaking immediately of their emotional effects. However, when officers did speak, or when they were encouraged to speak, about the effect of weapons on themselves it was possible to elicit from them something like the same distaste for mortar fire.

Reactions to actual conditions of battle appear to be influenced by the group rôle which distinguishes officers from men. Men, for example, appear to be much more deeply influenced by the effects of solitude and isolation, particularly by separation from the friends with whom they had, as it were, grown up in service and battle experience. Emotional ties to individuals appear to be much more essential to the well-being of the soldier than to the officer. To the latter, the tie is much more abstract. The soldier, it is true, has his group affiliations which heighten his pride and therefore help to maintain his morale. But it is more of a reciprocal relationship; he gets as much from membership of the group as he gives to the group. The officer however is under obligation *to* the group. He knows that his men rely on him and he less on them, even taking into account the fact that their response to his plans or encouragement is necessary to his carrying out his rôle. Therefore, whereas the soldier breaks down among other things through loss of a specific pal, commonly mentioned by name and with emotion during history-taking, the officer breaks down because of the feeling of loss of power to exhibit his responsibility. The figures in table I show this to a remarkable degree, and even where NCOs are conscious of their responsibility it does not seem to weigh on them so heavily because of their apparently closer emotional contact with the men.

This clearly signifies something important in the selection of officers. It seems to mean that in pre-selection the officer candidate must be judged not solely by his capacity for group coöperativeness, for his capacity to form healthy emotional ties to his men and colleagues, but for his capacity to rise above these ties and to maintain some measure of independence and objectivity—indeed, to take his responsibility almost as an abstract virtue, in which some degree of controlled disregard for others may prove to be a necessary ingredient. There may be a point where compassion too deeply felt may militate against his officer rôle.

Responsibility, as case-histories show, is not a simple endowment but composed of many ingredients. It is tied up with technical knowledge and intelligent understanding of that knowledge and its utilisation, a sense of the well-being of others, and, above all, an awareness of one's own integrity as a leader of others. The problem of the officer, as clarified by case-histories, is a dual one. He is obliged to divide his attention, and even more his emotional organisation, between self-preservation on the one hand and responsibility on the other. He must be able to endure this perhaps only temporary dichotomy to a greater degree than is necessary in other ranks. However much we can concede that the private has his sense of duty relating him to his fellows, the more intimate interpersonal ties are not to the same degree complicated by such quasi-abstract considerations as organising a party of men for action, keeping up their courage and sense of urgency, and other imponderable cognitive and emotional aspects of leadership. These latter demands are what put a particular strain on the officer; for he is obliged to maintain high-level awareness on a multitude of issues. The soldier is allowed, as it were, to react on a more primitive level, showing at such a level a primitive awareness of danger and opportunity for offensiveness. To the soldier his supports are his pals, whose example of endurance alongside him is a spur and a comfort. The officer must often rise above this.

This point may help us in making decisions, particularly with regard to the therapy of officer psychiatric cases. It appears that rehabilitation for officers should start very early; and officer patients, if once evacuated, should be given every opportunity to resume at an early date the officer rôle, and practice in responsible leadership should be an essential part of any therapeutic regime over and above individual therapy by sedation, abreaction, and resynthesis of war experiences. Wherever a hospital has a rehabilitation wing it should be possible for officer patients to participate in the exercises of men who have suffered similar disabilities, having practice in organising working parties and paramilitary exercises under the guidance of combatant officers. These latter should by preference be chosen for their knowledge of the technique of officers-selection; officers who have the insight derived from special military testing and

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judgment in War Office selection boards should therefore prove the best guides and philosophers in the rehabilitation of psychiatric cases. Coöperation with the psychiatrist who knows each officer's psychopathology may prove a valuable team technique in rehabilitation.

DIFFERENTIATION OF CLINICAL TYPES

With regard to clinical types, both in officers and in men the manifestations of breakdown were significantly different from those of the last war. Hysteria, where manifest, rarely took the form of those gross locomotor disturbances seen in the last war. Paraplegia, pseudoparesis of arm and hand, with the bizarre deformities described by Babinski and Lhermitte, have been rare in this campaign. The tremor and unsteady gait, however, typify the effects of immediate panic or horror rather than deep cleavages in psychophysical structure, which were classical forms in 1914–18. No doubt in that campaign the long weeks and months of a war of attrition provided that period of meditation which allowed for deeper cleavages in the mind. This may account for the rapid recovery of so many men in this campaign, aided by early sedation and reassurance in the near-battle zone. Furthermore, the elimination of large numbers of men of low intelligence from front-line service obviated the production of many cases of this elemental type of psychic cleavage.

The amnesias in this war were much more patchy, less profound, and more amenable to resolution by the simplest therapeutic techniques. It may well be that many such cases were seen by us some days after evacuation and after some measure of sedation had been administered and were already "softened up." Periods of loss of memory had little time to become encapsulated and therefore intractable to any procedures less than hypnosis or narco-analysis ('Pentothal' induction). It would be interesting to discover from advanced area psychiatrists how many neurotic casualties with or without strong neurotic predisposition were satisfactorily sent back to full duty after a few days' rest at field dressing stations or exhaustion centres.

"Exhaustion" can only be a refuge for timorous diagnosis if it remains attached to a man after he has passed through the hands of a forward psychiatric team. Few officers or men complained of true exhaustion or being (physiologically) "whacked." If anything, they were able to describe states of emotional fatigue resulting from incessant mortaring and shelling, particularly in the dark. Most men describe the state in such terms as: "I couldn't stick it any longer." "The noise got me down." "You never knew where they'd land." "Jerry was always trying something new." Officers, however, would add: "I couldn't keep touch." "I didn't seem able to lead any more." "Very often you didn't quite know whether you were going forward or back." "An 'offence' and 'defence' were meaningless distinctions." "It wasn't what I expected battle to be." "There was no front line anywhere." These remarks typify the state of mental confusion, the mother of emotional despair over and above the physical strain and stress. One officer, who was blown up and remained for a time wedged upside down in his tank, complained on waking from a short period of unconsciousness that he was more distressed by his powerlessness to do anything in self-defence than by any sense of physical exhaustion. It is surprising how quickly some men recover from such devastating upsets and yet how slowly others would recover from the effects of bombardment not always entailing immediate danger.

TABLE I—DISTRIBUTION OF FACTORS IN 57 NORMANDY PSYCHIATRIC CASES

	Other ranks (28*)	Officers (29†)
(a) Age (yr.)		
—21	6	2
22–26	10	6
27–30	8	12
31–35	4	4
35 +	0	5
(b) State		
Married	15	22
Separated	1	0
Single	12	7
(c) Length of service		
1–3 yr.	13	4
3–4 yr.	8	11
5 yr. +	7	14
(d) Enlistment		
Regular	7	..
Volunteers (TA)	3	..
Army class	18	..
(e) Diagnosis		
Anxiety:		
Depressive	6	7
Confusional	1	3‡
Hysteria:		
Visceral	1	1
Motor	6	5
Sensory	14	4
Amnesic	4	9
(f) 1st evac. as casualty		
1st week	8	3
2nd–4th weeks	20	10
After 4th week	..	16
(g) Type of warfare at breakdown		
Defence	17	10
Attack	9	11
Not clear	2	8
(h) Precipitating causes		
Type of weapon most complained of:		
Mortar	10	4
Shell	10	7
Bomb	2	1
Sniper	2	0
Own barrage	1	0
Doubtful	3	17
Other causes		
Death of a comrade	7	0
Heavy casualties	5	4
Exhaustion and privation	3	2
Illness	0	3
Change of unit	0	2
Near explosion	0	5
Recent domestic stress	5	0
Overwhelming sense of responsibility	1	12
Sense of isolation	0	1
(i) Predisposing factors		
1. Unfavourable environment in first 10 years of life	14	8
2. Previous personality adduced from life-history and self-estimate:		
Cheerful (syntonic)	5	11
Solitary	13	5
Over-conscientious	6	8
Suspicious	2	1
Indeterminate	3	3
3. Evidence of previous neurosis or clear character deviation	19§	18‖
4. Dependency attitude with no neurosis or clear character deviation	2	2
5. Morale level before D-day:		
Keen	6	13
Compliant	14	11
Resentful	3	..
Doubtful	5	5
Previous battle experience	8	6

* 7 NCOs, 21 privates.
† 1 lieut.-colonel, 3 majors, 4 captains, 21 lieutenants.
‡ 1 postconcussional. § 13 neurotic breakdowns.
‖ 12 neurotic breakdowns.

TABLE II—REACTION TYPES IN OFFICERS AND MEN

Reaction type	Officers	Men
Anxious, timid, over-dependent	2	9
Over-aggressive	2	0
Deep-seated conflict, over-aggression	8	6
Emotionally unstable	7	6
Apparently normal	10	7
Totals	29	28

PREDISPOSITIONAL FACTORS

As will be noted from table I, the presence of neurosis and clear-cut character deviation in pre-war days was equally divided between officers and men. But in the men unfavourable environmental circumstances of a gross kind in early life were clearly a commoner factor in men than in officers. As can be seen from table II the basic reaction types are evenly distributed as between officers and other ranks. Solitariness of disposition was found much more often in men than in officers, which suggests that the capacity to form widely distributed social ties was lower in men than in officers. This should make us regard capacity for wider social relationships as a necessary ingredient of character in the preselection diagnosis. The following is an example of breakdown in group relationships of an otherwise excellent officer.

Major X, age 27, a regular officer who entered Sandhurst in 1936, where he did well in studies and games. He served with distinction in N. Africa and Sicily when he received the MC. After an active battle period of 9 months he went to France on the day after D-day. He alleges that all his party were pretty exhausted with pre-invasion exercises before landing. For a time his unit was isolated and in the waiting period for a second advance he became apprehensive; later in a small engagement he broke down when a personal friend was killed near him. He repeatedly said that he could never keep going again unless he were back with his old unit and his personal affiliations. He can no longer tolerate discipline and alleged that without the support of his old friends he would never be of use again. This makes him

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depressed, irritable, and most intolerant of discipline. "When we were all together discipline didn't seem to matter." Always a cheerful sociable type with a bent for amateur theatricals, he had at one time contemplated going on the stage. While at school he had hoped to go to Dartmouth to keep up a family naval tradition. An apparently subsidiary problem has been his engagement and eagerness to get married before going into action again. This has been a great preoccupation, and from his description of his fiancée it appears she is a strong character on whom he leans very much.

This was an overtly normal person with a good soldierly disposition engendered largely by his ideal to maintain the high Service tradition of his family. Fundamentally he was a very dependent type who must receive the support of others to carry on. He did exceptionally well with fairly superficial psychotherapy lasting 3 weeks. He was then getting married and prepared to go back to full duty. A rehabilitation period as an instructor at OCTU was recommended.

Another example illustrates the problem of lack of power to hold responsibility in men with high initial morale but with small powers of resistance.

Lieutenant X, age 21, single. Enlisted September, 1941, when aged 18, and got his commission through selection board. Did not do too well at OCTU but passed out in average grade. Landed in Normandy on D 41 and was changed to another unit, much to his disgust. Under shellfire but not in attack at first. Did not like early bombing and machine-gunning but received great support from an ex-policeman NCO. He found his unit in low spirits when he joined them as they had been having a rough time holding a defensive position. This jumpiness affected him and he did not feel he had the capacity to pep them up. Had to hold a position for 5 weeks, but developing a philosophic resignation he was able to lead his men in a subsequent attack. In tank attacks he began to feel his leadership capacity waning and he confessed to making serious errors of judgment. These appear to have been exaggerated and were based on too high an ideal of his rôle. Felt the sufferings of his men were due to his ineptitude. "I couldn't hold down the job if I went out again." For a week he was depressed, irritable, and rather self-accusatory. Wanted to fight his battle out and refused sedatives. He welcomed psychological interviews and became very communicative. His attitude was deeply involved with his attitude towards his mother. An only son who feels he cannot abandon her. Alleges that in Normandy thoughts of her were a constant preoccupation. "I always wanted to do things on my own but mother constantly stood in my way." "This made me angry with her as I wanted to prove myself. I haven't done so and can't face up to leaving others." After 5 therapeutic sessions he made good improvement and was discharged category B for 3 months. Has now much more insight and self-reliance. Does not think his mother worries as much about him as he thought.

SERVICE IN THE EAST

Comparing a group of officers who served only in Normandy with a group who served in the Mediterranean and eastern theatres of war some instructive differences emerged. In the latter group the men were frequently subjected to the debilitating effects of tropical diseases——malaria, dysentery, &c.—to which organic stresses one must add the stress of contact with alien peoples and environments. Wherever they fought, men were subjected not only to the threat of the enemy as a visible aggressor but to the threat of the unseen invaders, the malaria parasite, &c. But above all, and round about, the new and not so romantic scene of strange countries, customs, and ideals. This has come out with clarity with carefully taken histories. The officers in particular, largely by education (or the lack of it) and social affiliations, appear to have had no preparatory concepts regarding the world they would be obliged to live in and to some extent share. The men by and large took a more matter-of-fact—indeed, ribald—attitude towards natives and their countries, and were more prepared on the whole to accept the rough life wherever it was to be found. They were less critical of the social environment of India, Burma, or Abyssinia, and perhaps were less outraged by differences of custom and social forms.

Does not this suggest that wherever possible officers in particular should be carefully briefed with regard to the social structure and modes of the people among whom they are to work? Intellectual curiosity may go a long way to paving the way to understanding and sympathy and should engender in them the capacity to tolerate strangeness as well as hardship. Those destined to serve in Burma should see in the Japanese not merely "yellow devils," a concept which arouses infantile dread, but a people with a culture of a different kind, with a political outlook alien and abhorrent to us, but not merely the possessors of a physique which, unamiable as it may be, is an irrelevance at most, and productive of destructive fears.

Men serving in the east have enough to bear from heat and pestilence without burdening them with a load of cultural ignorance which isolates them from their environment, intensifies nostalgia, and thereby materially lowers morale. Indeed, for very obvious reasons nostalgia and a pining for the familial and the familiar is an important obstacle to adjustment. Terms of service abroad are longer, and chances of leave, except to the local base, are negligible. Wounds or breakdown due to mental and physical sickness are treated at base hospitals in the local command, whereas in the western theatre there is the feeling that home, if not reached for long stretches of time, lies only across a narrow sea.

SUMMARY

A series of cases of psychiatric breakdown among officers and men from Normandy is analysed for type and period of breakdown, and outstanding ætiological factors. All cases were observed for periods ranging from 4 to 8 weeks.

Diagnostic differences were not outstanding in any way. The alleged predominance of hysteria in men was not substantiated.

Officers tended to break down later than men.

Domestic stress was more commonly present as a background factor in men than in officers.

Sense of responsibility appeared to be much the most potent factor in breakdown among officers. In the men group affiliation and the loss of comrades have a most potent effect; they appeared to be more solitary than officers, less able to form new group affiliations, and therefore less able to suffer mental trauma.

Officers seem less capable than men of adjusting themselves to alien surroundings. Before serving abroad—particularly in the East—officers should be taught something of the social customs of the civilian population they are to encounter.

REPAIR OF PERFORATING CORNEAL WOUNDS

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THE treatment of corneal wounds rests on two methods—(1) covering the wound with a raised flap of conjunctiva, and (2) direct suture. The former is more generally used (Goulden and Whiting[1]), while the latter is perhaps gaining ground. This is a report of a personal series of 34 cases treated by suture.

The aim of surgery is to save any eye which can be made safe and useful, not to retain those which are useless and disorganised; they are better excised, saving weeks of illness and great disappointment. It is unjustifiable to run any risk of sympathetic ophthalmia for an eye which will never see. The routine use of penicillin may result in the retention of a greater number of such eyes, and some of these are likely to be subject to recurrent inflammation.

This series is confined to cases without retained foreign bodies. Nor does it include minor perforations for which no operation was needed; these are common, have a good prognosis, and their treatment is not in doubt. The cases are divided according to whether or not there was a traumatic cataract, as this is the point of greatest importance in prognosis. All except 4 required abscission of uveal prolapse. All had sulphathiazole, but no penicillin.

In the cataractous series of 15 cases, 7 were excised, 4 for infection and 3 because they remained irritable.

1. Goulden, C. B., Whiting, M. H. Surgery of Modern Warfare, Edinburgh (edited by Hamilton Bailey), 1944, p. 823.

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Of the others, 7 had at least good projection of light, and expectation of reasonable aphakic vision. The remaining patient developed a severe corneal ulcer and had no useful vision; he will be mentioned again. Most cases had one or two sutures; 5 required three sutures, and 2 of these eyes were retained, though both had severe corneal scarring and excision might have been better treatment. The only reason for keeping such severely damaged aphakic eyes is the remote chance of loss of the good eye by accident later. The little blurred vision they give is often a nuisance, and although the patients are always grateful that their eyes have been "saved," not infrequently they change their minds later and are sorry that an excision was not performed.

In the 19 cases with intact lenses, 1 eye was lost from infection; 5 had vision of 6/6–6/9, 9 vision of 6/12–6/18, and 2 vision of 6/60; 1 had a dislocated lens and vitreous hæmorrhage; and the last was a young child whose vision was not taken. So 14 of the 19 patients had at least reading vision. In this series three sutures were used on four occasions, and all the eyes retained; 2 at least of these cases were successful, having visions of 6/12 and 6/18.

Although small, these figures do illustrate the influence of lens damage on the prognosis. Delay in attending hospital does not appear to make any difference to the outlook, because it occurs chiefly in the less severe cases. Three cases waited for four days before attending, and 2 of the eyes survived, one with vision of 6/6 after abscission of iris prolapse and wound suture.

Causes of the injuries were various. Industrial accidents, household accidents, darts, arrows, and wood-chopping by bad technique were the most frequent. Four were from flying glass; none of these eyes had cataracts and all were retained. Of 3 due to broken spectacles, one had a vitreous hæmorrhage but the other 2 were left with reading vision.

Repair by conjunctival flap.—A consecutive and unselected series of similar cases treated in other hands by conjunctival flaps shows corresponding results, but a very large number would have to be compared in order to judge the merits of the two methods statistically. The conjunctival flap series also consists of 34 cases. Of 15 cataractous eyes, 9 were excised, 3 showed poor projection of light because of vitreous hæmorrhage or detached retina; 3 offered hope of improved aphakic vision. Of 19 cases with undamaged lenses, 5 were excised, 9 had reading vision of 6/18 or better, and 5 worse than this.

TECHNIQUE OF CORNEAL SUTURE

Perfect conditions are required for corneal suture. With them the operation becomes comparatively simple; otherwise it is exceedingly difficult and good results cannot be expected. Unless the patient is under full control and coöperative, general anæsthesia (especially 'Pentothal') is advisable. An ordinary overhead theatre lamp is useless, an intense spotlight being needed; Lister's lamp is the best. As a makeshift I have successfully used an ordinary headlamp, but the voltage must be increased to a point at which the bulb is soon burnt out.

Whether a binocular loupe should be used depends on the surgeon's preference and accommodation. Eyeless atraumatic needles and waxed silk are improvements on the technique here described; they were not however used in any of these cases and are not essential.

The wound lip is held by a straight toothed iris forceps, and a suture of black (being easier to remove later than white) 00 silk on a Maddox needle is passed through the superficial edge. The suture does not enter the anterior chamber; after taking up both lips of the wound it is tied firmly and cut very short. The sutures are placed so that their minute scars will not interfere with central vision, and as few as will obtain accurate apposition are used. It is usually better to abscise any uveal prolapse before inserting the sutures, as loose threads will be in the way, but occasionally, if a vitreous prolapse threatens, they may be inserted before the abscission and tied afterwards. It is most important to avoid any pressure on the globe during the operation; this requires great care, or vitreous may be lost.

After 8 or 10 days the stitches are removed. With a proper light this may usually be done n the ward, otherwise the patient is taken to the theatre. It must be explained to him that this is not another operation, and he should by this time have sufficient confidence in the surgeon to believe him and not be unduly anxious. Young children will however require a short general anæsthetic, which is a disadvantage.

It is not claimed that there is anything new in this method, which was described and advocated by Praun,[2] who gives a reference to its description by Dieffenbach in 1847.

CONJUNCTIVAL FLAP OR SUTURE?

The technique of a conjunctival flap will be found elsewhere (Goulden and Whiting).[1] Its aims are: (1) to close the wound; (2) to cover and protect it from infection; and (3) to provide blood-vessels and fibrous tissue to aid repair. Many wounds continue to gape under their flap. This is especially likely during the anxious early postoperative period in response to any external pressure on the eye. Delayed healing and further prolapses may result. Covering of an open wound by conjunctiva is not a certain safeguard against the entrance of infection; the position is the same as in a trephined eye, where late infection is a major complication. If retraction of the flap is delayed, observation of the progress of the eye is prevented at a time when it is necessary: if retraction is early it may occur before the wound is healed. Both these complications occur. The wounded cornea is perfectly well able to heal without being covered by conjunctiva, as is seen best in Tudor Thomas's operation for corneal grafting. The essential is that there shall be firm and accurate apposition of the wound edges. The displacement of a large flap of conjunctiva ensures that the eye shall remain red and irritable for a long time; it may then be an anxious matter to decide whether the irritation is due to the original injury or to that inflicted at operation. Failure to obtain the smallest possible linear scar increases corneal astigmatism; a weak scar may give way, causing enormous astigmatism. Scarring near the central area of the cornea much reduces vision; this is especially so when the flap has left behind tags of conjunctiva adherent to the cornea.

In an instructive recent case, a flap had been put over a small limbal wound after abscission of an iris prolapse. The wound remained open, and after a few days vitreous was seen to be presenting; this was abscissed and the flap replaced. The final result was not unlike a trephine, with vitreous in the wound. Initial suture of this wound would have given a firmly healed scar, less astigmatism, and no risk of late infection.

It has been objected that suturing is difficult. Given proper conditions for any ophthalmic surgery, this is not so. Many surgeons use corneal sutures constantly in cataract extraction. With sutures the wound edges are firmly closed and held so. This achieves healing in the shortest time with minimal scarring; it is, after all, the method used everywhere else in the body. Closure of the wound is the surest way to keep out secondary infection, and the rapidity with which the wound becomes watertight is seen by the recovery of the anterior chamber. Rapid recovery of the anterior chamber reduces the incidence of anterior synechiæ, and this has an important bearing on prognosis, the eye settling more quickly and requiring fewer subsequent operations. Inflammation being minimal, the patient is comfortable with a sutured eye, and it is easy to assess its progress.

In this series of 34 cases there was no infection of the stitch site. One patient did develop a severe conjunctivitis and a corneal ulcer, but it was neither in the wound nor the stitch site, although the stitch was still in place. This is important, as corneal sutures are often accused of inducing corneal infection; they may become infected, but it is very uncommon.

In a restless patient, or one who has to be moved soon after operation, the sutured wound is very secure and allows greater freedom than can be permitted with a flap, but there are some wounds which cannot be properly sutured, such as those with ragged edges, some with œdematous edges (where there has been delay), and others which show loss of corneal substance; these must be treated by flaps.

2. Praun, E. Die Verletzungen des Auges, Wiesbaden, 1899, p. 179.

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PENICILLIN IN GONORRHŒA

SUGGESTED SCHEME OF TREATMENT

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DIFFERING schemes have been suggested for the treatment of gonorrhœa with penicillin, and in the main the tendency is towards a long "time-spread," up to forty-eight hours or more, with a dose of penicillin up to 20,000 units per injection at varying intervals, with a total of from 100,000 to 150,000 units. This type of treatment, with its small fluctuating low level of penicillin in the body over a long period, is successful in many cases, but it seems to us unnecessary and extravagant in "man-hours," now so vitally important. Using trial doses of penicillin controlled by slide, culture, and blood-serum inhibition levels, we have evolved a scheme of treatment which is more economical in time and labour, and does not necessitate admitting the patient to hospital.

Using the hæmolytic streptococcus technique described by Sir Alexander Fleming (1944) to estimate the bacteriostatic effect of the patient's serum, we carried out a series of experiments to determine (*a*) the minimum dose of penicillin required to give an adequate bacteriostatic effect against the gonococcus, (*b*) the frequency with which a dose of penicillin had to be repeated to maintain an adequate bacteriostatic level in the patient's serum, (*c*) the minimum time such a level need be maintained to give an optimum cure rate. Our laboratory work combined with our clinical experience suggests that unless "serum inhibition" was present in a serum dilution of not less than one in eight, and was maintained for 9½ hours, the high rate of cure which we expected was not obtained.

In the table the dosage and results obtained, when using six different courses of penicillin injections, are contrasted with the standard or routine course finally adopted (bottom line of table). Figs. 1–7 are graphs of the bacteriostatic titre in the patients' blood-serum plotted against the time elapsing from the first dose of penicillin. These graphs correspond to the seven courses as indicated in the table. They were made from single controlled cases or were averages of a number of controlled cases, as indicated on the figures.

It is clear that all the courses of penicillin were capable of maintaining the bacteriostatic titre above a serum-dilution of 1:8, but the table and the graphs together demonstrate that relapses, irrespective of size of dose and the intervals between them, were relatively frequent in those courses in which the titre of 1:8 was not maintained for over 8 hours. On the other hand, fig. 1 (based on 40 controlled cases) indicates that when the titre was maintained at 1:8 for over 9 hours, relapses practically disappeared (see bottom line of table).

This is a remarkable observation, when the great variability which is generally exhibited by the complex biological interactions between host, parasite, and specific drug is considered, because, in the special series of case in question, the mere addition of 2 hours and 30,000 units of penicillin (see figs. 1 and 4) to a course of treatment was followed by a reduction of the number of relapses from 6 in 25 to 1 in 265 (see table).

Recent work by Romanski and Rittman (1944) with peanut oil and beeswax to delay the absorption of penicillin, and by Beyer, Woodward et al. (1944) with *para*-aminohippuric acid to delay its excretion, may radically alter present ideas of treatment. We have carried out experiments with penicillin incorporated in different vehicles but our results so far have been inconclusive, and until other methods have proved superior our routine scheme of treatment will be retained. This course has cured 265 unselected cases of gonorrhœa with only one relapse and will be adopted as the standard treatment for gonorrhœa in the Royal Navy.

Scheme of treatment.—30,000 units dissolved in 1·5 c.cm. of pyrogen-free sterile distilled water was injected intramuscularly or deeply subcutaneously at two-hourly intervals for five doses—i.e., 150,000 units in eight hours.

Selection of cases.—In this series the cases were unselected. Every case sent to our establishment for treatment over the trial period was treated in this way.

RESULTS OBTAINED WITH DIFFERENT DOSAGES OF PENICILLIN AND (BOTTOM LINE) WITH THE ROUTINE COURSE ADOPTED

Dosage (units IM)	No. of cases	Relapses	Average days to relapse	Total amount of penicillin	Blood curve
				units	
20,000 hrly × 5	6	1	2	100,000	Fig. 2
30,000 hrly × 5	81	6	5	150,000	Fig. 3
30,000 two-hrly × 4	25	6	5	120,000	Fig. 4
50,000 half-hrly × 3	6	2	2	150,000	Fig. 5
50,000 hrly × 3	15	3	2	150,000	Fig. 6
75,000 hrly × 2	6	1	1	150,000	Fig. 7
30,000 two-hrly × 5	265	1	2	150,000	Fig. 1

IM = Intramuscular injection.

The gonococcus was demonstrated in every case before beginning treatment. Of the first 200 cases treated by the scheme, 26 were sulphonamide-resistant; 9 were failures or relapses from other schemes of penicillin treatment; 7 were chronic prostatic infections having had their discharge for periods ranging from 3 weeks to 5 months; 6 were having 'Mapharside' and bismuth for concurrent syphilis; and 1 was having neoarsphenamine.

Tests of cure.—Patients were given urethral and prostatic smears and cultures 48 hours after treatment (by this time the blood-serum and urine are penicillin-free), and a week, a month, and 2 months after treatment. This was the ideal aimed at and set as our standard of cure, but the drafting arrangements of the Service have necessarily interfered with this procedure in some cases; in spite of this 48% of cases have completed this supervision, 15% six weeks' supervision, and 27% are still under surveillance.

RESULTS

Of the 265 cases treated to date in this series, one only (no. 140) has failed to respond to the course of penicillin. This was a case of anterior urethritis and no reason for the failure could be found. The penicillin could not have been at fault, for the batch was in general use at the time; the penicillin required for the treatment of all cases that day was made up in solution in bulk and the other cases treated the same day responded satisfactorily. Forty-eight hours after initial treatment the patient had a very slight discharge in which smears and cultures proved positive. He was then given a second similar course of treatment and cleared up without incident, showing that the gonorrhœa was not "penicillin-resistant." The failure must be ascribed to some undetermined personal factor.

Two cases of acute epididymitis complicating gonorrhœa were among the series. These were gonococcus-negative to smear and culture after the penicillin treatment, but one could not claim that the condition of the testicle responded more rapidly than it would have done with other forms of treatment. Failures from previous courses of penicillin treatment given elsewhere, and the cases of chronic prostatic gonorrhœa, all responded satisfactorily. Sulphonamide-resistance has made no difference whatever in the response to penicillin. In our series no case developed any form of complication after

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Continued from previous page

DR. CRAWFORD: SUMMARY

A personal series of 34 perforating wounds of the cornea, without retained foreign body, were treated by corneal suture.

The prognosis is seen to rest largely on the occurrence of cataract. The technique of corneal suture is described, and the method compared with that using a conjunctival flap.

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the commencement of treatment, and no case of *Ps. pyocyanea* infection has been observed.

For one, two, or more days after completion of the penicillin course, threads or haze were present in the patients' urine, with perhaps a slight mucoid urethral discharge. This is considered a postinflammatory condition and should not be regarded in any way as indicating failure unless proved by smear and culture. One can compare this to the residual inflammation in an eye from which a foreign body has been removed. Further local treatment (e.g., irrigations) may be necessary in some of these cases; only 6 of our first 200 cases had to have this additional treatment.

Two interesting points were observed from culture and slide control during treatment with the dose used in this series—slides were normally gonococcus-negative 4–5 hours after commencing treatment; and we have not been able to culture the gonococcus after 90 minutes from the commencement of treatment in those cases which subsequently passed our test of cure.

Three cases of acute gonorrhœa in women, not included in the above figures, were treated by this scheme. Two have passed their tests of cure and the third is probably cured and is still under surveillance.

Syphilis accompanying gonorrhœa.—The importance of thorough dark-ground examination of serum for treponemata from any possible syphilitic lesion before commencing treatment with penicillin cannot be over-emphasised. Van Slyke and Steinberg (1944) describe two cases of gonorrhœa with penile sores treated with 125,000 units of penicillin intramuscularly in 24 hours. Dark-ground examinations were not made until after the penicillin treatment for gonorrhœa was completed, and then were repeatedly negative for *Treponema pallidum*, but serological tests, negative at first, became positive after 4–5 weeks. In our series one case had a gonococcal urethritis and a penile sore in which the *T. pallidum* was present. He was treated for gonorrhœa by our scheme before commencing antisyphilitic treatment, and dark-ground examinations revealed no spirochætes 11 hours from the commencement of treatment, and were still negative at 21 hours, when he began his antisyphilitic treatment.

Four cases developed primary chancres, one at 3, two at 4, and one at 7 weeks after treatment of their gonorrhœa, the double infection having been contracted apparently at the same time. In these cases the dark-ground examination was positive for *T. pallidum*.

A Wassermann reaction and Kahn test are done on every case before treatment and is repeated with the final test of cure.

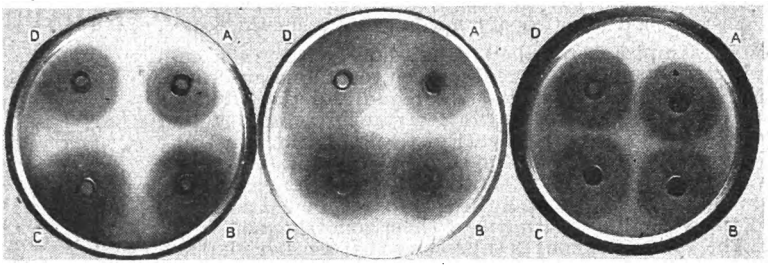


Fig. 8—Cylinder plate experiments with *Staph. aureus* to show in-vitro action of penicillin combined with arsenical and bismuth preparations. Each cylinder contained penicillin solution, 5 units per c.cm. A, B, and C also contained the arsenical or bismuth preparation: A 10%, B 30%, and C 50%.

USE OF PENICILLIN WITH BISMUTH AND ARSENIC PREPARATIONS

It has been stated that heavy metals may interfere with the bacteriostatic action of penicillin, so we deemed it important to decide what effect, if any, arsenic and bismuth preparations had. We conducted a series of in-vivo and in-vitro experiments to determine this.

In-vitro experiments (fig. 8).

Expt. 1.—To a solution of penicillin containing 5 units per c.cm. was added (*A*) 10%, (*B*) 30%, and (*C*) 50% mapharside by weight: (*D*) was the control, containing penicillin only. These solutions were maintained at 37° C for 30 minutes before being employed in the test. Using the cylinder plate method (Heatley 1944) with *Staph. aureus* (Oxford strain) on an agar plate, (*A*) and (*B*) showed the same zone of inhibition as the control (*D*), (*C*) showed a slightly reduced zone. The plates were read after 20 hours' incubation at 37° C.

Expt. 2.—The first experiment was repeated with neoarsphenamine. The 50% solution (*C*) showed a slightly reduced zone when compared with the control (*D*).

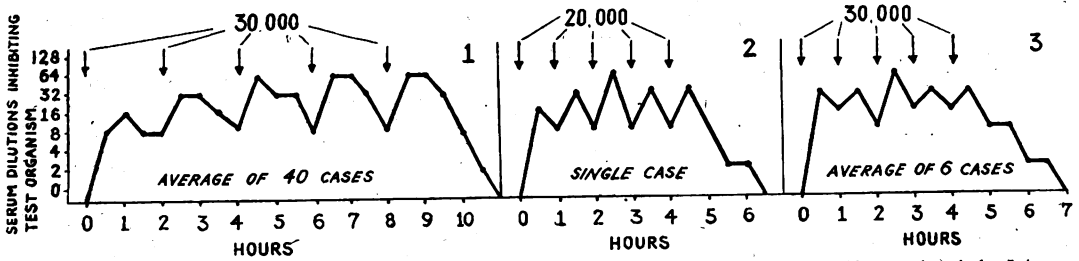
Expt. 3.—Using 'Bisoxyl' (bismuth oxychloride 10%), and the same conditions as in the previous two experiments, no inhibitory effect on the action of the penicillin solution was observed.

It must be realised that the ratio of these preparations to penicillin used in the three experiments is much greater than could possibly occur in vivo using therapeutic doses.

In-vivo experiments.

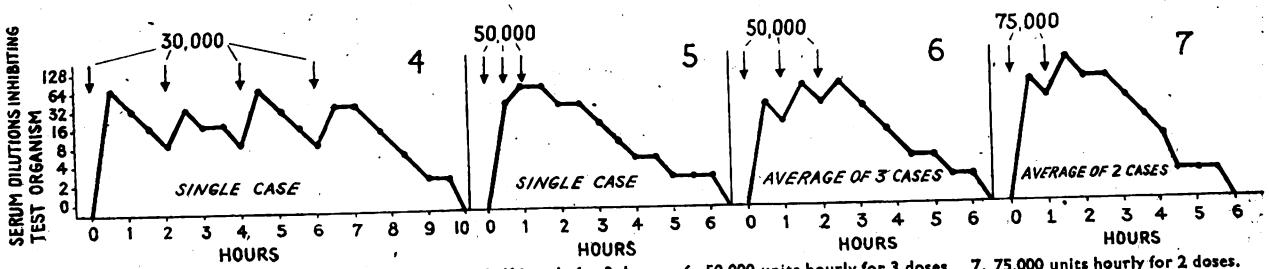
Expt. 1.—A patient was given 0·04 g. of mapharside with a standard (30,000 units two-hourly × 5) penicillin course; the mapharside being given with the second injection of penicillin.

Expt. 2.—A second patient was given 0·45 g. of neoarsphenamine with the second injection of penicillin in a standard unit course.



Figs. 1–7 Bacteriostatic levels in blood-serum during penicillin treatment with different dosages given intramuscularly.

1. 30,000 units two-hourly for 5 doses. 2. 20,000 units hourly for 5 doses. 3. 30,000 units hourly for 5 doses.



4. 30,000 units two-hourly for 4 doses. 5. 50,000 units half-hourly for 3 doses. 6. 50,000 units hourly for 3 doses. 7. 75,000 units hourly for 2 doses.

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Expt. 3.—A third patient was given 2 c.cm. of bisoxyl with the second injection of penicillin in a standard course.

Blood samples were taken at half-hourly intervals, and, using the hæmolytic streptococcus technique as before, serial dilutions of serum were made and the dilutions capable of inhibiting the test organism estimated and graphed. These were identical to fig. 1 (the control).

Clinically, 6 cases in the series were under treatment with mapharside and bismuth, and one with neoarsphenamine and bismuth. All these cases responded normally to the penicillin treatment of their gonorrhœa.

The above evidence is suggestive that neither mapharside, neoarsphenamine, nor bisoxyl in therapeutic doses has any inhibitory effect on the action of penicillin. The synergic effect which some writers have suggested that arsenicals may have in penicillin treatment is neither confirmed nor refuted by these observations.

SUMMARY

We have presented an eight-hour scheme for the treatment of gonorrhœa which has cured over 99% of a series of 265 consecutive cases.

Sulphonamide-resistance or the duration of infection did not appear to have any effect on the response to penicillin.

With the tests of cure carried out in this series, the possibility of asymptomatic carriers following this treatment of gonorrhœa with penicillin appears to be negligible.

Concomitant arsenic and bismuth therapy is not a contra-indication to the use of penicillin in the treatment of gonorrhœa.

We wish to thank Sir Alexander Fleming for his advice, and the Chief Petty Officers and staff for their coöperation in this work.

Postscript (Sir SHELDON DUDLEY)

The advantages of this routine treatment of gonorrhœa to naval medical administration are immense. It means that, if a man reports in the sick bay at 8 o'clock in the morning he will be discharged to duty at 4 o'clock the same afternoon. He is thus treated and cured in his own ship or place of duty within the working hours of one day. Seeing that before the war it took on the average about 50 days to cure a patient suffering from gonorrhœa, the economy in man-hours and sick-beds is overwhelming. The special benefits of a course of penicillin injections which does not extend over a night is the avoidance of all hospitalisation, a resulting economy in night-duty staff, ambulance transport, bedding, paper work, and delay in starting treatment, besides the often unavoidable delay and difficulty in getting a man in or out of hospital from or to his ship.

In future gonorrhœa should cause far less trouble and disability in the Royal Navy than the common cold.

REFERENCES

Beyer, K. H., Woodward, R., Peters, L, Verwey, W. F., Mattis, P. A. (1944) *Science*, **100**, 107.
Fleming, A. (1944) *Lancet*, ii, 620.
Heatley, N. G. (1944) *Biochem. J.* **38**, 61.
Romanski, M. J., Rittman, G. E. (1944) *Science*, **100**, 196.
Van Slyke, C. J., Steinberg, S. (1944) *Ven. Dis. Inform.* **25**, 229.

AIR EVACUATION OF CASUALTIES.—In the past 2½ years about 800,000 sick and wounded patients of the American and Allied Armed Forces have been carried in American army planes. The death-rate in flight has been 0·005%. In 1944 one out of every five American war casualties returning to the United States went by air. Military strategists, it is stated, prepare for the prompt removal of the wounded from the battlefields as a tactical necessity.

BRITISH COUNCIL.—Prof. James Mackintosh, dean of the London School of Hygiene, is visiting Sweden to lecture for the council on housing, nutrition, and other aspects of social medicine and health education in Britain. He will probably also visit Finland. Professor Mackintosh hopes to obtain in Sweden information for inclusion in a report on housing which he is preparing for the British Government.

REHABILITATION IN A NAVAL HOSPITAL

H. JACKSON BURROWS, MD CAMB., FRCS
SURGEON COMMANDER RNVR; ASSISTANT ORTHOPÆDIC SURGEON, ST. BARTHOLOMEW'S HOSPITAL, LONDON

THE recent advances in rehabilitation treatment, besides its christening—if this is an advance—have been mainly in the direction of (*a*) healthy, if perhaps too exclusive, insistence on its most important component—namely, active exercise; (*b*) a revival of interest in the application of graduated mechanical load; (*c*) better appreciation of the value and limitations of remedial games; (*d*) improved assessment of results in terms of functional activity, particularly muscle power, coördination, and resistance to stress; and (*e*) the share taken in countering physical and mental deterioration in hospital—i.e., in the maintenance of morale.

Too much must not be asked of "rehabilitation." No amount of rehabilitation treatment will retrieve bad surgery. Nor will it often supplant surgery; patients are sometimes sent to rehabilitation centres to struggle against impediments which would respond to surgery and to nothing else. Although rehabilitation activities may assist diagnosis in selected cases by promoting signs and symptoms, in general the "rehabilitation" of undiagnosed or wrongly diagnosed patients is useless or harmful.

A patient made poor progress after the removal of a normal meniscus from his knee; no amount of effort seemed to restore the quadriceps. He was spurred on to greater efforts; he was sent to rehabilitation centres; all failed and he was sent back to his unit to get on as best he could, branded as one who would not try hard enough. He had wasting, shortening, and coldness of the whole limb and homolateral pes cavus—evidence of an old infantile paralysis in a limb which no amount of flogging could restore.

Nothing delays recovery more than over-haste. Though disability periods can be minimised by good rehabilitation the record-breakers are those who send their patients back to duty unfit. In some hospitals more of the patients' time is lost by bad organisation than can ever be made up by rehabilitation. The other side of the picture is that return to work after trivial injuries has been delayed by rehabilitation—I was once asked by a patient to postpone his discharge so that he could finish his rug!

The purpose of a Service hospital at home in wartime is to restore as many men and women as possible to duty in the best possible condition in the shortest reasonable time. Patients who can never be made fit for useful service are much better treated in a civilian hospital. The time factor is important, but is wholly secondary to the qualitative factor. The essential thing is that the man should return to duty fit—alert, nimble, and capable of endurance.

In common with the other Services, the Navy in wartime is composed, for the most part, of "civilians in uniform." Nearly all would be much better paid, much safer, much more comfortable, and much happier about the future, if in "civvy street." Thus in the Navy, as in the other Services, there is a great temptation to be ill, or to use illness as a means of escape. It is greatly to the credit of the Service that so few, relatively, make use of the opportunities which illness offers. None the less, it is asking for trouble to take the genuinely ill man—with his judgment warped by illness—and practically take him out of the Service, place him in a civilian hospital, mix him with those who will go home to jobs worth £6 a week, and expect him to get well as quickly as possible. Most do, but it is asking too much of the weaker vessels. Consequently, Service hospitals start with a substantial advantage over civilian hospitals.

The Navy has succeeded little or no better than the other Services in the difficult problem of rehabilitating patients by suitable duties at depots and bases. Something has been achieved at some of the smaller ones through the keenness of individual medical officers, but the big depots under present conditions are no places for unfit men. This fact enphasises the importance of rehabilitation in hospitals and special centres.

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The Navy possibly contains a larger proportion of volunteers than the other Services. This may not be altogether an advantage; the volunteer is more readily disillusioned and lacks the satisfaction of blaming fate. Variety is provided not only by the Navy's ubiquity but also by its comprehensiveness: it comprises sailors, soldiers (marines), and airmen. It is a Naval tradition that a medical officer should be a doctor first and foremost—and of what could a man more rightly be proud? "Hospital blues" have long seemed to me to be psychologically bad; when up and about patients of a Naval hospital wear ordinary uniform "ashore" and a simple dark blue rig when on board.

Too much has been said of the "hospital atmosphere." This may be good or bad: it varies between hospital and hospital, and between ward and ward in the same hospital. It depends on many things, but above all on the quality of the staff, especially the medical and nursing staff. The usual assumption is that the hospital atmosphere must be thoroughly bad, and it is thought necessary to send patients to rehabilitation centres not so much to recover from the final effects of their illness as to recover from the effects of its hospital treatment. Indeed, the tendency has been to transfer them as soon as possible from the miasma of the hospital to the ozone of the rehabilitation centre. From the viewpoint of the local lesion such early transfer may be premature. This is not a criticism of rehabilitation centres, but of their misuse. The right time for "rehabilitation" to start in most orthopædic cases, and in many others, is on first admission to hospital; and the principal aim should be the *prevention* of the ill effects of the so-called "hospital atmosphere." Rehabilitation in hospitals and rehabilitation in special centres should be complementary rather than mutually exclusive.

ORGANISATION OF REHABILITATION

The following is a summary of the organisation of rehabilitation at the largest of the RN auxiliary (or temporary) hospitals—one very beautifully situated, ten miles from a university city, with its medical school and other amenities.

In their more restricted sense, the rehabilitation treatments here are divided for convenience into: (1) recreational treatment, (2) physiotherapy, and (3) occupational therapy.

Recreational treatment is modified physical and recreational training, and incorporates both physical education and remedial games. It is carried out by two physical and recreational training (PRT) petty officer instructors, both of whom have had some remedial training; one was a physical training instructor in civil life, the other a schoolmaster. Most orthopædic patients not acutely ill on admission start recreational treatment forthwith. Those confined to bed carry it out there. Patients who are allowed to sit out of bed, but not stand or walk, and those on crutches, attend a small class in the gymnasium. Those able to walk attend a more advanced class, suited to their disability, and so on up to a final class of full physical training and games. Besides those games which form a large part of modern physical training, and a large part of its remedial application, the following are played: bowls, croquet, skittles, darts, billiards, table-tennis, deck-tennis, lawn tennis, badminton, clock and miniature golf (up and down steep slopes), volley ball, fencing, cricket, football, &c. These can all be used remedially as well as diversionally. The importance of variety also needs no emphasis.

The gymnasium in the rehabilitation block was unavoidably small, and the hall of the aforetime mental hospital has been used for the larger classes and indoor games. Use of the ideal place—the open air—is much curtailed here by the local climate, in spite of the provision of tarpaulins by the British Red Cross Society.

What strikes visitors most—even more than the agility of patients in plaster—is the universal infectious enthusiasm and spirit of enjoyment, which probably depend more than anything on the personality of the instructors.

Physiotherapy.—Though the PRT instructors, as experts in physical education, are the most appropriate exponents of recreational treatment under medical supervision, they are not usually the most suitable persons to carry out individual treatment of patients' local lesions in the early stages. This falls to chartered physiotherapists. Of these we have four: a Naval petty officer (hostilities only) and three members of the Physiotherapy Service. Their accommodation includes six cubicles—containing plinths and apparatus for heat, light, faradic and galvanic treatment—and, above all, a small gymnasium fitted with the usual accessories such as mats, stools, wall bars, and various means of applying progressive exercises, from assisted and gravity-free exercises up to those against graduated mechanical resistance. Much the most important part of the physiotherapists' duties is instruction in and supervision of progressive exercises—a function which seems to be denied them in some rehabilitation centres, where they have become mere rubbers and electricians. The opposite popular tendency—the almost total neglect of such accessory methods as heat and electrical stimulation—is also avoided.

Passive movements (except as manipulations under anæsthesia) are generally banned in favour of movements which can be carried out voluntarily, but they are used, in suitable cases, for those physiological movements of joints which are without direct muscle control, and also extensively in paralytic cases before the stage at which re-education becomes possible. The fashionable condemnation of passive movements has been much too sweeping, with disastrous consequences for some patients with lower motor neurone paralysis.

Occupational therapy.—General work in the wards, galleys, and grounds is carried out by patients under the direction of the sick-berth staff. The rehabilitation block contains an occupational therapy workshop, with store and office, and there is provision under a trained occupational therapist and a staff of VAD's for carpentry, fretwork, turning, French polishing, boot-repairing, fancy leather work, spinning, weaving, netting, rug-making, knotting, basket-making, raffia-work, model-making, toy-making, soldering, poker-work, and tailoring. Minor surgical alterations to boots are undertaken, and the construction of clogs for walking plasters. Occupational therapy is not reserved for patients for whom it is directly remedial, but is applied also diversionally, especially for bed-ridden patients; most ratings are without intellectual pursuits and gladly turn to manual ones. Steps are being taken to remedy the undue tendency towards indoor occupations, and those savouring strongly of the "arts and crafts" movement. The triumph of the æsthetes over the philistines, which is common to most occupational therapy departments nowadays, is probably neither wholly desirable nor wholly avoidable.

Prescription, coördination, and supervision.—Rehabilitation treatments, like any other treatments, are prescribed in the patient's notes, which are sent to an office in the rehabilitation block at a fixed hour. Here a VAD clerk arranges the various appointments, and at the same time the concerned PRT instructor, physiotherapist, and occupational therapist can all take such particulars as they require. The notes are then returned to the ward forthwith. All attendances are checked through the same central office. There has been a recent trend in rehabilitation schemes to plan the whole of a man's day for him. In hospital this may amount to over-regimentation, and we have tried to leave something to individual effort and initiative. The work of the orthopædic specialist and the two medical officers who assist him is so arranged that all take their share in supervision of the treatments.

Records.—During the recovery of joint injuries—accidental or operative—the girth of the joint, the girth of the muscles, the angle of movement, and the muscle power are measured weekly by one physiotherapist, using standardised methods, and the measurements of normal and pathological limb are charted. The charts are valuable, especially in recording the progress of muscle power, a factor which is too often neglected in assessing a patient's fitness for duty.

Selected groups of cases are specially recorded for investigation, but the conditions of Naval service make serious follow-up wellnigh impossible. A frequent complaint is that medical officers of ships or shore establishments hear no more of patients whom they send into hospital. Our practice, therefore, on the discharge of each patient, is to send to the originating medical

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officer a summary of the diagnosis, treatment, result, and disposal. This is in addition to the routine letter sent to his next medical officer when the patient returns to duty. This system, which has been widely appreciated, has been made possible by the provision of a VAD stenographer, who also types the notes on new cases and the letters concerning patients sent for consultation.

Clinical photography is carried out by the radiological department under Surgeon Commander J. M. Fitzpatrick, RN.

Temporary splinting.—Temporary plaster-of-paris splinting, sometimes incorporating elastic traction appliances, is extensively used in the rehabilitation treatment of some patients. The practical part of this work is carried out by two VADs attached to the theatres, who have been trained as plaster technicians.

Coöperation with schoolmaster.—The wish of the Educational Branch to coöperate in rehabilitation was welcomed. Importance is attached to the stimulation of an intelligent interest in current affairs, and many establishments have "information rooms" in which instructional material—literature, diagrams, maps, photographs, &c.—is displayed regularly and with frequent changes. With the generous help of the British Red Cross Society an information-room has been furnished in the lobby of the hall of this hospital, so that patients have an opportunity of absorbing mental fare provided by the schoolmaster in the intervals of their recreational training supervised by the PRT instructors. It falls to the schoolmaster also to arrange debates, discussions, and other means of adult education, with the more particular object of stimulating and maintaining a lively topical interest. Valuable as the schoolmaster's services may be, it must be acknowledged that most patients turn much more readily to handwork than to headwork.

Social services and entertainments.—Anyone coming from a civil hospital misses the expert help of an almoner, and tends to mistrust—and rightly—his own amateur dabbling. The dietitian is another highly valued aid who has not yet found access to Service establishments. A canteen is provided, its profits going towards patients' amenities. A library is run through the good offices of the Red Cross Society.

The *least* amount of "passive" entertainment required for the maintenance of morale in Service hospitals is difficult to estimate, and must be inversely proportional to the amount of active work and recreation provided. The *desirable* amount is even more difficult to determine. At this hospital the tradition has been one of liberality—two film shows and a variety entertainment weekly, plus occasional organised and unorganised afternoons "ashore," if not interfering with treatment.

Sick leave has been condemned too freely. Leave is at least as advisable and even necessary for the sick man, or erstwhile sick man, as for the well one. A substantial period in hospital should usually be followed by some leave before return to duty, and often a really long period in hospital should be interrupted once (rarely more often) by a visit home. These are leaves with a therapeutic object. I regard leave, rightly handled, as an aid to rehabilitation. The same cannot be said of "plaster leave," which often is therapeutically unnecessary; rehabilitation centres are usually better places than their homes for patients in plaster-of-paris. The Navy, in permitting sick leave at the medical officer's discretion, puts within his grasp an additional weapon for rehabilitation, but it must be handled with the respect due to weapons.

For permission to publish this account I have to thank Surgeon Vice-Admiral Sir Sheldon Dudley, Medical Director-General of the Navy. I should also like to acknowledge the help of Surgeon Rear-Admiral H. R. B. Hull, superintendent of the hospital, Surgeon Rear-Admiral R. Milne, orthopædic consultant to the Navy, Surgeon Captains W. I. Gerrard and A. W. Kendall, the senior medical officers, Surgeon Commander J. Coulter, the sports and instructional officer, Surgeon Commander (D) H. P. Buchanan, the entertainments officer, the medical officers who have been my assistants from time to time, and Mrs. Quentin Irvine and others of the British Red Cross Society.

Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the section of neurology on March 1, with Air Vice-Marshal C. P. SYMONDS, the president, in the chair, a discussion on the

Treatment of Acute Meningitis

was opened by Dr. M. MITMAN. He recalled that in 1907–08 the case-fatality rate of young adults suffering from meningococcal meningitis was 74%. During the last war serotherapy and spinal drainage reduced the figure to 39%; in this war the figure is 3·5%, thanks chiefly to chemotherapy. He warned against assessing the value of any specific therapeutic measure without considering the four chief factors influencing mortality. The first, the virulence of the organism, differs in every epidemic and in the intervals between them. The second, immunity, is related to the capacity to overcome infection at different ages. Startling results of therapy, such as 99–100% recoveries, occur only in the most favourable age-groups; the figures are much higher for the extremes of life. (Commenting on this later, Surgeon Commander ELEY, US Navy, said that tender age is not entirely responsible for the high fatality-rate among infants: diagnosis on them is delayed because their open fontanelles allow considerable increases in intracranial pressure.) The third factor influencing the fatality in an epidemic is the organisation for the prompt diagnosis and efficient treatment of cases. In a severe outbreak in the USA, for instance, the reduction of case-fatality from 12·8% at the beginning to 1·5% a few months later was attributed largely to expeditious treatment. The vital importance of the diagnosis of meningococcal infections in the septicæmic phase lies in the amazing success of chemotherapy at this stage. The fourth factor influencing a favourable result is the specific therapy used. The place of penicillin for meningococcal infections is as yet uncertain: it may be merely adjuvant. The sulphonamides, in Dr. Mitman's view, are still the drug of choice, and his preference is for sulphadiazine, although he agreed with other speakers that a drug with less tendency to urinary complications, such as sulphamezathine, might prove more suitable after further trial. He prefers a moderate dosage. Big doses, especially intravenous loading ones, are given with excessive quantities of fluid which wash out the drug; the net result is the same as when a moderate dose is given with less fluid, but the danger of side-effects is greater with the big dose. Ninety-five per cent. of cases respond to sulphonamides. The remainder, representing fulminating cases and those with adrenal syndromes, require adjuvant therapy. On the theory that there is some adrenal failure in such cases, substitution therapy is used—adrenal cortical extract or desoxycorticosterone acetate for the adrenal deficiency; sodium chloride or lactate with fluids to compensate for the depletion of sodium and of water; glucose for the disturbance of sugar metabolism; and plasma for symptoms of shock.

Dr. HONOR SMITH found neither penicillin alone nor sulphonamides alone adequate for the treatment of pneumococcal or streptococcal meningitis, although penicillin is seldom necessary in meningococcal infections. Only by the intrathecal route can adequate doses of penicillin reach the meninges. It must have free access to the cerebrospinal pathways, and the presence of block is an indication for cisternal or ventricular administration. In cases of pneumococcal meningitis treated at Oxford the primary infection present was usually an otitis media or a sinusitis, less commonly a fracture of the skull involving the sinuses, and only rarely a simple pharyngitis. On the first day of treatment 8000–20,000 units of penicillin is given intrathecally, combined with systemic penicillin to control the primary infection, and with sulphadiazine in 2 g. doses four-hourly, the loading dose being 4 g. Next day the spinal fluid should be sterile, although the cell-count may rise as the result of chemical reaction. A second dose of penicillin is given at the time the spinal fluid is removed for examination; rarely a third is necessary 12 hours later. A primary focus left untreated often clears up during this treatment. Relapses, if repeated, suggest some intracranial focus to which the penicillin is not obtaining proper access.

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Brigadier HUGH CAIRNS said that 50% of cases with intracranial foci inaccessible to penicillin require surgical help. The diagnostic problem is to determine whether the focus is extradural or intradural; it was usually intradural. He and other speakers called particular attention to the importance of a scrupulous aseptic technique in the performance of lumbar puncture.

Dr. E. S. DUTHIE said the three drawbacks to penicillin therapy are chemical meningitis, the possibility of meningeal cross-infection, and the loss of ankle-jerks which occasionally occurs. Penicillin as at present available is only a third pure, and not all specimens are suitable for intrathecal use. Batches which cause severe reaction on intramuscular injection should be rejected, and specimens known not to irritate should be reserved for intrathecal administration. Makers cannot guarantee the bacterial purity of penicillin, and the preparation of a sterile solution for intrathecal use is best performed in laboratories. Cross-infection with *Ps. pyocyanea* is most difficult to treat because it is not susceptible to either sulphonamides or penicillin. Every gram-negative organism should be investigated to exclude *Ps. pyocyanea*. Penicillin, like sulphonamides, exerts its lethal effect during the dividing stage of the organism. Within 24 hours almost all organisms divide, but the small fraction of 1% which do not divide remain alive and are responsible for some of the relapses. Commenting on Dr. Mitman's statement that serum and sulphonamides have been reported to produce worse results than sulphonamides alone, Dr. Duthie suggested that serum may inhibit cell division, thus limiting the number of organisms in the susceptible stage; he was prepared to investigate the laboratory aspect of this possibility.

Dr. WILLIAM GUNN thought there might still be a place for combined sero- and chemo-therapy provided the serum was antitoxic.

Little was said at the meeting about the treatment of meningitis due to *H. influenzæ*, having regard to the high relative incidence recorded in America. Dr. DONALD PATERSON had secured a small amount of Alexander's serum which he proposed to try out.

Commenting on the importance of prompt treatment in the small percentage of urgent cases of meningitis—e.g., those resembling subarachnoid hæmorrhage in the abruptness of their onset—the PRESIDENT thought the consultant, warned on the telephone of the type of illness, might with advantage go prepared with penicillin.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

WHEN the society met on Jan. 19, for the first time since the outbreak of war, Prof. FARQUHAR MURRAY of Newcastle, the retiring president, introduced the new president, Dr. A. A. GEMMELL of Liverpool. A symposium on

Virilism

was opened by Dr. C. P. BRENTNALL, who described a case of *Arrhenoblastoma of the ovary associated with pregnancy and labour*. There were no undue symptoms until the woman reached the fourth month of pregnancy, when evidence of virilism began to appear; masculine distribution of hair appeared on the abdomen, chest, and face; the voice became deeper and the clitoris enlarged. There were none of the usual defeminising phenomena: the breasts, instead of atrophying, showed the usual changes associated with pregnancy, and the amenorrhœa of pregnancy could not be described as defeminising. Glycosuria was constantly present, and this was probably another example of the Achard-Tiers syndrome. The woman was delivered by cæsarean section, and the ovarian tumour removed under local anæsthesia. Lactation then began and continued normally. The phenomena of virilism disappeared in six months after operation, except for the deeper voice. At birth her child appeared to be normal except for the external genital organs. There was no doubt that she was a female pseudohermaphrodite. The clitoris was much enlarged, and the labia majora were enlarged and corrugated. There were no labia minora, and no external entrance to the vagina. The urethral orifice was situated at the base of the clitoris, and the perineum extended unbroken to the anus. On the fourth day of life there was a discharge of blood and mucus from the urethra, such as is not uncommon from the vagina of newborn girls; and this was taken as a proof of the presence of a normal uterus. Nature's and laboratory experiments on the administration of androgens to pregnant mammals were discussed. In this particular case it appeared, from evidence in the mother and child, that androgen from the ovarian tumour reached the child in effective quantity during the third month of fœtal life, and resulted in the partial masculinisation of the external genitalia.

Dr. J. W. A. HUNTER described a case of *Arrhenoblastoma of the ovary* in a single girl aged 19 years. Her periods began at 11 years and were regular until she was about 15. After that time her voice became deep and her abdomen enlarged. Nine months later menstruation ceased and the breasts were reduced in size. Eighteen months after this hair appeared on the face, legs, and chest. She came to hospital because of the striking increase in size of the abdomen. A hard tumour could be felt, reaching nearly to the xiphisternum. There was free fluid in the abdomen; and at the time she was admitted to hospital she had a pleural effusion. A large tumour with an enormous blood-supply was found at laparotomy and removed with great difficulty. No metastases were seen. The patient's condition while in hospital was never good; and in spite of blood-transfusion she died about 12 hours after the operation.

Dr. J. W. BRIDE described another case of *Arrhenoblastoma of an immature type*, in a single woman of 32 years, who complained of menorrhagia for five or six months. Examination showed hirsutism, especially of the face, necessitating daily shaving. Her intellect was dull. There was a masculine distribution of hair on the abdomen and a hard mobile mass was palpable there. The clitoris was greatly hypertrophied. Laparotomy showed a solid ovarian tumour about the size of a fœtal head, and this was removed. Two years later the clitoris was much smaller, the hair on the face was much less, and she was needing to shave only once or twice a week. Her general health was good.

Dr. A. A. GEMMELL described a case of *Adrenogenital syndrome due to bilateral cortical hyperplasia of the adrenals*. The patient came complaining of primary amenorrhœa and some abnormality of the vulval region. She was of male configuration with no breast development; but had no facial hirsuties. Her voice was of female timbre and she had a normal feminine outlook. On examination under anæsthesia on April 26, 1944, the phallus was found to be 2 in. long, but no other abnormality was apparent. On May 5 Dr. Hain of Edinburgh estimated the ketosteroids as 35 mg. per 24 hours, and pregnandiol as 60 mg. per 24 hours. In June these had increased to 74 mg. of ketosteroids and 73 mg. of pregnandiol. On June 6 Mr. C. A. Wells amputated the phallus, and laparotomy was performed. The uterus was small and the ovaries appeared normal. A biopsy of the right ovary was taken. This showed atretic and normal immature follicles, and two large follicles, one with both granulosa and theca layers. Both adrenals were enlarged. A diagnosis of congenital bilateral suprarenal hypertrophy was made, and on the 27th Mr. Wells removed the left suprarenal by the transcostal route. It was elliptical, measuring 3·5 in. × 2 in. × 0·5 in., and weighed 23 g. after fixation. Vine's stain showed an androgenic reaction. There were no fuchsinophil cells in the outer zone. In the mid-zone 25% of the cells gave a positive stain, and less than 25% in the inner zone. The ketosteroid and pregnandiol levels fell to 32 and 31·5 mg., but they had risen again by Jan. 3, 1945. Up to December, 1944, menstruation had still not occurred; and there had been no enlargement of the uterus and no change in voice.

Mr. T. N. A. JEFFCOATE described a case of *Adrenogenital syndrome due to an adenoma of the adrenal cortex*, in a single woman of 30 years, who complained of primary amenorrhœa, and growth of hair on the cheeks, chin, and upper lip. The hirsuties had been present for 16 years, having gradually developed soon after the age of 14. She had a deep voice and a muscular and masculine figure with male distribution of hair. The breasts were undeveloped, and the nipples deeply pigmented. There were slight hypertrophy of the clitoris and a septate vagina with a hypoplastic cervix. Psychologically she

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was mainly feminine, interested in clothes and babies; sexually she was neutral. At laparotomy a tiny infantile uterus was found. The ovaries were pale, with numerous tiny cysts due to atretic follicles. Biopsy was performed to confirm that the glands were ovarian. The left suprarenal was felt to be larger than the right and appeared spherical. The patient recovered from the operation and later a ketosteroid secretion test was performed. The result of 140 mg. per 24 hours was the final link in the chain of evidence. Mr. Wells agreed to explore the left adrenal through the left loin three weeks after laparotomy. In the upper pole of the gland he found a rounded tumour which shelled out easily; this was removed together with a small portion of normal tissue. About half the adrenal was left behind. The tumour, roughly ovoid in shape, was 2 inches in diameter, greenish purple in colour, dull red on section owing to considerable extravasation of blood. Microscopically it was seen to be composed of cells of recognisably adrenal origin. They showed a strong positive reaction to Vine's stain. Although at the time the pathologist suggested that the tumour was of a low grade of malignancy, the patient is alive and well 2½ years later. The results of the removal were classical. Eight weeks after operation the patient menstruated for the first time; and has done so regularly since. The uterus has grown to about normal adult size. After 2½ years the voice and the clitoris are unchanged, the breasts have enlarged, and the skin is of finer texture. The figure is slightly more feminine. The hair did not drop out dramatically, as is often described, but is slowly becoming more feminine in distribution, and after electrolysis is showing a diminished tendency to return. The ketosteroid excretion within a month of operation had dropped to 3 mg. in 24 hours. Psychologically she is slightly more feminine, more modest, and less self-conscious.

Reviews of Books

Rehabilitation of the Injured

Occupational Therapy. JOHN H. C. COLSON, CSP, MAOT, technical director of rehabilitation, accident service, Royal Sheffield Infirmary and Hospital. (Cassell. Pp. 226. 15*s*.)

THIS book should be useful to the surgeon who has had little experience of occupational therapy and wants to prescribe it for his injured patients. The crafts are analysed carefully, and graded voluntary movements are suggested for every muscle and joint. Mr. Colson is perhaps more keenly interested in the patient's muscles and joints than in his mind. Yet the response to remedial work must always depend largely on the patient's attitude to it. The occupational therapist knows that if she can make him curious about what the patient in the next bed is doing, his impulse to imitate, and his innate desire to construct will do the rest: he will consent to having his ankles harnessed to Mr. Colson's loom, or do anything else she suggests. She knows, too, that unless his interest is kept up progress will be disappointing. Mr. Colson's contention, that "physical and psychological occupational therapy are so fundamentally different in their scope and work that a separate book is needed for each subject," is thus hardly borne out in practice. Only if the patient continues to use his mind will he benefit his body and limbs. This shows itself in the details of weaving: Mr. Colson considers that not more than two heddles should be used, a good arrangement while the patient is learning to flex and extend an injured knee-joint; but pattern weaving on a loom with six pedals is almost as good a coördinating exercise as playing the pedal keyboard of an organ. A patient has become keen on the patterns he learns to weave on a handloom, and when promoted to a foot-loom will unconsciously coördinate delicate pedal movements in order to complete his design. In washing-up may be "the fingers are flexed into a tight fist round the cloth in order to reach the inside of the article, the drying actions consisting in full range pronation and supination of the forearm"; but unless the patient is willing to wash up, he might just as well be "doing exercises" by command. Orderlies supervising housework must therefore understand something of everyday psychology—as Mr. Colson unconsciously recognises when he says they "must be good disciplinarians and keen." All the chapters on special occupational therapy are full of good matter, and curative workshops will find good use for this book.

Stitt's Diagnosis, Prevention and Treatment of Tropical Diseases

(7th ed.) RICHARD P. STRONG. (H. K. Lewis. 2 vols. Pp. 1747. £5 5*s*. the set.)

IT is opportune that one of the best textbooks on tropical medicine should now reappear, again under the editorship of Prof. R. P. Strong. The two volumes resemble the previous edition in format and matter; minor alterations and additions have remedied omissions and brought the book up to date. Development of the sulphonamides in the treatment of bacillary dysentery, the vaccine prophylaxis of epidemic typhus, and the chemical, insecticidal, and insect-repellent agents employed in malaria prevention have all been included. Mite-borne typhus diseases are given more space, and a new clinical entity—Bullis fever, a tick-borne rickettsial disease encountered in American troops in Camp Bullis, Texas—is briefly described.

Nutrition and Relief Work

A Handbook for the Guidance of Relief Workers. (Published, for the Council of British Societies for Relief Abroad, by the Oxford University Press. Pp. 111. 5*s*.)

THE first three chapters of this little book give the basic facts about nutrition and undernutrition with—as the authors themselves say—"the familiar defects of brevity." Simplification has certainly led to some doubtful statements, but they make some good points too, for example: "Most national diets, if not nutritionally adequate, can usually be made so by suitable modification, without any drastic alterations in their general pattern. This is an important principle to bear in mind, because efforts to improve nutritional standards by methods which run counter to long-established traditions and usages will be very difficult to apply in practice." The eating habits of European countries, and the repercussions which the war may have had on them, are discussed at some length. In Hungary, for instance, we learn that so much more sugar was eaten in the towns than in the country, before the war, that an overall ration which meant a cut of 50% in urban consumption allocated to country folk several times as much as they had ever taken up before, and actually led to an increase in the national consumption. This section seems to hint that the essence of a hot meal in many parts of Europe is soup. The inevitable tables of food values follow, with some practical hints about food storage, and a description and diagrams of 14 different kinds of field kitchens and ovens. There are appendices on European currency, weights, and measures, suggested forms for reports, and a German-French-English glossary of words likely to be required by a relief worker. The book, turned out of the same mould as *Famine* and *Relief*, may help those setting out to put Europe on its feet again, and can be recommended to anyone interested in the food and food-habits of countries other than his own.

Bibliography of Aviation Medicine Supplement

P. M. HOFF, E. C. HOFF, J. F. FULTON. (C. C. Thomas. Pp. 109. $2.50.)

THIS supplement appears two years after the publication of the original bibliography, and the classification, arrangement, and style closely follow that of the parent volume. A new sub-heading on survival and rescue covers work on self-preservation at sea, and in the arctic or the jungle. The two most notable additions are the English translations of Paul Bert's *La Pression Barométrique* and the Russian textbook *Fundamentals of Aviation Medicine*. It is to be regretted that the necessity for military secrecy prevents the authors from including many references which would be of outstanding interest, but in spite of this the bibliography and its supplement provide a well-arranged and reasonably comprehensive system of references to the fundamental work on which aviation medicine is based.

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THE LANCET

LONDON: SATURDAY, MARCH 24, 1945

Partial Starvation and its Treatment

IN August 1940, when our fortunes were at their lowest, the PRIME MINISTER foretold the eventual liberation of Europe, and added:

> We shall do our best to encourage the building up of reserves of food all over the world, so that there will always be held up before the eyes of the peoples of Europe, including—I say it deliberately—the German and Austrian peoples, the certainty that the shattering of the Nazi power will bring them all immediate food, freedom, and peace.[1]

To bring immediate food, freedom, and peace must still be our aim, but so far we have only been moderately successful. Sir JAMES GRIGG, Secretary for War, told the Commons on March 13 that about a million tons of food had been sent to Italy up to the end of last year; by February Greece had received 150,000–200,000 tons; and over 300,000 tons have been provided for France, Belgium, and Holland since D-day, including substantial contributions from the stocks of the Ministry of Food. He then went on to say:

> But though we have got so far without disaster, I do not conceal from the House my fear that in the coming months the demands for foodstuffs for the liberated countries may become almost overpowering. The news from Holland still in German hands shows that the population are in desperate straits, and . . . when liberation comes there is likely to be little help from local resources. Then, when we get into Germany, there will be displaced persons, not by their thousands but by their millions, who will look to the armies for food. The combined resources of the Allies may be strained to the utmost to prevent hunger and indeed starvation, especially if our victory comes before the new harvest is gathered.

In parts of Europe—to say nothing of the East—scarcity of food is not a mere possibility but already a fact. During this year therefore a great many doctors will have to be prepared for dealing with the effects of under-nourishment. We must hope that downright starvation—lack of everything but water—will be rare: most of the cases will be suffering only from a deficit of calories, of protein and fats, of mineral elements, and of vitamins. Nevertheless intelligent care will be very necessary. The manifold results of faulty balance in the diet will add to the difficulty, and symptoms are likely to be protean.

Straight starvation has been investigated in animals and man, as MAGEE [2] reminded the Nutrition Society last year. Many have assumed that once hunger pains have disappeared, as they do about the fifth day, death from starvation is a gentle fading away, not entirely unpleasant: but unfortunately this may not be so. MAGEE pointed out that the body conserves the strength and weight of the nervous system, the skeleton, endocrines, and reproductive organs, and the losses fall on the skin, the muscles, and the digestive organs. The most noteworthy effects are on the alimentary system: the hydrochloric acid of the stomach decreases, the columnar cells are flattened, absorption is lessened, and intestinal ulcers develop, especially in the large intestine. These findings have been observed in man as well as animals and probably account for the diarrhœa simulating dysentery described in cases of severe malnutrition. It is perhaps worth noting that immunity reactions are lost by the starving, and it may be necessary to vaccinate them afresh if smallpox is about.

The nutritional œdema already mentioned in reports from the Continent is caused by having insufficient protein in a diet low in calories.[3] The limited amounts of protein which would suffice if the calories were adequate are diverted to produce energy; the plasma thus becomes deficient in proteins, its osmotic pressure falls, and fluid leaks into the tissues; and much salt in the diet is likely to increase this leakage.[4] Children do not develop typical œdema, but are pale and doughy-looking. They become thin—that is, less waterlogged—on being fed. When this œdema is combined with gastro-intestinal trouble the patient is in grave danger. Minor features, recalling nicotinic-acid deficiency and scurvy, are a red desquamated tongue and swollen inflamed gums. Major symptoms are dilatation of the stomach and a profuse watery diarrhœa, with frequent evacuations, often mistaken for dysentery. There are severe pains in the stomach and lower gut, and the diarrhœa leads to dehydration. Judging by recent reports nutritional œdema was seen among the French and Belgians more commonly during the first two years of occupation than it is now. After the early days these people supplemented their diet from an extensive black market, and so avoided the worst effects of the official ration. Neurological symptoms suggestive of vitamin deficiencies have not been generally described, though SIMONART [5] claims to have found neuritic signs which were relieved by injections of aneurin. Clinically his cases had more in common with nutritional œdema than with beriberi, and it would be unfortunate if his solitary experience was used as an argument for sending vitamin concentrates in place of foods.

The treatment of partial starvation was reviewed by GOODMAN [6] in an address to the Medical Women's Federation a year ago. Mild cases will promptly respond to a diet of easily digested foods—particularly milk, eggs, meat, fresh ripe fruit, and cereals. (In view of transport difficulties, dried milk, even dried skimmed milk, dehydrated fish, and dried eggs will probably be used, and they should prove beneficial.) Much fat is contra-indicated, because of the diarrhœa. After a fortnight the patient should be able to take any ordinary diet, but absolute rest in bed for at least two weeks is highly desirable. Intermediate cases require hospital treatment and good nursing. Feeding should be cautious, beginning with milk and dairy products, and avoiding excess of fat. Pepsin and hydrochloric acid may be needed to help digestion, and mild diuretics to get rid of the œdema. Mercurial diuretics have been found dangerous: EVANS and PERRY [7] thought that occasional deaths following the use of such drugs for cardiac or renal œdema might be connected with lowering of plasma protein; and this factor would of course operate also

1. Quoted by Famine Relief Committee (67, Brook Street, London, W1) in a memorandum to the European Committee of UNRRA.
2. Magee, H. E. *Bull. Nutrition Society* (in press); and see *Lancet*, 1944, 1, 436.
3. Jimenez-Diaz, C. *Nutr. Abstr. Rev.* 1943, 12, 3678.
4. Perakis, Bakalos, *Deut. med. Wschr.* 1943, 69, 746.
5. Simonart, E. F. *Scalpel*, May 10, 1941; Jan. and May 20, 1942.
6. Goodman, N. M. see *Lancet*, 1944, 1, 576.
7. Evans, H., Perry, K. *Lancet*, 1943 1, 576.

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in the starving. Serious cases must have hospital care, good nursing, warmth, and good food if they are to have any chance at all. They need frequent feeds of milk, gruels, and lean meat, with pepsin and hydrochloric acid. MAGEE referred to the value of intravenous injections of glucose, and of opium to control diarrhœa. The prognosis is good in mild cases except when the patient is very old; in intermediate cases it is good for those between 20 and 40 years of age, but bad for the very young and very old; in serious cases it is bad for all ages, but those between 20 and 40 have the best chance. As so often, women have a better chance of recovery than men.

Of late years a new method of saving these severely ill patients has come into our hands: they can be nourished directly with protein digested into its component amino-acids, given intravenously with glucose. Severe inanition, nutritional œdema, and dehydration have responded to this measure, which was used during the famine in Bengal, and it has also given successful results with infants suffering from intractable diarrhœa, and with premature babies. Possibly the metabolic functions of the liver are helped by such hydrolysates. In Bengal the mortality among cases uncomplicated by pneumonia or malaria, treated in this way, is said to have been only 8%, whereas control cases treated with glucose-saline showed a mortality of 67%. Cases of dysentery with intestinal ulceration are stated to have benefited considerably. Unfortunately, however, amino-acid preparations suitable for intravenous injection are still scarce. A single preparation ('Amigen') in America is said to be safe; other English and American preparations may produce febrile reactions. Nor can amigen be readily prepared in large amounts. Serum and plasma, though not as good nutritionally as protein hydrolysates, have some food value, and also reduce œdema by restoring plasma protein; and though they carry a risk of infective hepatitis, they may well be used to save life. The important point is that the starving patient who cannot eat is no longer necessarily a lost man: we have found a new way of saving him, and must develop it.

One last point is probably relevant. It may be that the malnutritional state known as kwashiorkor,[8] described in the tropics and occasionally in Europe and America, has become common in occupied countries or in the East during the war. The patients—who show œdema, dermatoses, and a so-called deficiency bowel-pattern as demonstrated by X rays—are found to respond to the addition to the diet of the whole vitamin-B complex, either as liver or yeast; and parenteral administration of the vitamins of this group has been suggested. Let no-one imagine, however, that what liberated countries chiefly require are accessory food factors and special preparations of amino-acids. To quote our special correspondent's report on discussions with medical authorities in Paris: "Vitamins, I was told very emphatically, are not the problem: what is needed is meat and fats."

8. Williams, C. *Arch. Dis. Childh.* 1933, **12**, 193; *Lancet*, 1935, ii, 1151; Brown, J. S., Trowell, H. C. *Ibid*, 1944, ii, 812.

Sir THOMAS LEWIS, FRS, physician to University College Hospital and consulting physician to the Ministry of Pensions, died at his home at Rickmansworth on March 17. He was in his 64th year.

Future of the Medical Museum

MANY years ago an eminent physician was discussing medical education with a museum enthusiast. "Museums!" he said. "Do you know what I would do with medical museums? Burn the lot." A survey of the hospital museums of the period, and indeed of many of the famous Continental collections, would have supported his verdict. A visitor to most of these museums must have been depressed by what he saw—an apparently endless series of jars containing specimens of doubtful value from which every vestige of colour had long departed, a few tattered and out-of-date catalogues, derelict zoological curios, a few prize dissections, a mouldy collection of botanical specimens, some obsolete surgical instruments, one or two dangling skeletons, and some wax models of skin diseases. No provision was made for the comfort or convenience of students: apparently they were not expected to sit down. It is not strange that little use was made of such museums except as a storehouse for specimens to be used by the teaching staff to embellish their lectures, or as a test of mental agility in the examination halls. Frequently specimens of little value were kept indefinitely because they had been presented to the museum by some influential member of the staff. (But there was a gleam of light in the darkness, for here and there were choice collections, carefully preserved, fully catalogued, and set out in such a way that they were of real value to the thoughtful student.) If such museums are not entirely a memory of the past, there has been much progress during the last 25 years, not only in the quality of material displayed but also in the method of arrangement. Many are, however, still cramped by lack of space, money, and staff. In spite of this, the medical museums have increased in popularity. Both students and teachers tend to use them more.

There are still some who question the value of medical museums; but, as Professor GREY TURNER pointed out in his stimulating Hunterian oration, they offer facilities for study which would be hard to replace by any other means. Moreover, they are of inestimable value to the student whose brain is better served by the eye than the ear. The functions of a medical museum are education, research, and conservation. The first of these is the chief function of a hospital museum: it is an additional weapon in the teacher's armoury; a place where the lessons learnt in the wards, outpatient department, and post-mortem room can be synthesised; a centre for revision; a system of visual training which encourages the student to employ his powers of observation; and a storehouse from which the teacher may draw whatever he needs to illustrate his lectures. It is probable that in the future the hospital museums will be used more and more, not only by the regular students but also by graduates returning for mental refreshment.

Medical museums may conveniently be divided into national collections, teaching museums, and special museums (e.g., public health, medicolegal, industrial, war collections, specialties, historical, anatomical). All of these could well be included in the national museum, though for certain reasons this may not always be advisable. Our national collection

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has suffered disaster. On the night of May 10, 1941, the famous Hunterian Museum was severely damaged by high-explosive bombs and by fire: the greater part of the museum and many of its collections were destroyed. In his oration GREY TURNER says: "The disaster has not only imposed a greater responsibility than ever before, but has provided an opportunity." The responsibility falls on the whole medical profession, for in the past the museum has been the proud possession of all—the best of its kind in the world. Its speedy restoration is not only a tribute to the past but also an obligation to the future. The President of the Royal College of Surgeons has asked for financial support in carrying out this great work and it is an appeal no member of the profession can ignore. Reconstruction is the watchword at the present time, and here is a work of reconstruction in which every member and fellow of the college may play a part. The plans for the future have been drafted on progressive lines which take into account the three essential functions of such a museum: it will provide for education, research, and the preservation of what is valuable. Here many of the special collections will find an appropriate home, while others can with greater advantage be dealt with elsewhere. The war has produced its own medical and surgical problems, and from them much may be learnt that will be of value in time of peace. We referred last week to the National War Collection now being made which deals with war injuries—a collection which offers promising scope for future investigation and adds further testimony to the value of the museum as an aid to research.

The future of the hospital museums is in no way affected by the establishment of a great national museum. The hospitals possess unique facilities: they have a constant supply of the material needed for teaching purposes. In the post-mortem room, X-ray department, photographic studio, pathological laboratories, and other special departments is a vast store of material from which may be drawn the exhibits necessary for the teaching museums of the future. The day of the pathological museum, as we knew it of old, is past; and already the leading hospital museums are adopting a broader view. A specimen of a heart affected with subacute bacterial endocarditis is instructive, but its value for teaching purposes is enormously increased by placing alongside the other organs included in the morbid process—what GREY TURNER has called a "group exhibit." To complete the picture may well be added colour photomicrographs, temperature charts, electrocardiograms, X-ray pictures, paintings, photographs, and any other clinical records bearing on the specimen under consideration. By such a method the whole teaching of ward, post-mortem room, and laboratory is revived; and the illustrations need not occupy much space. For nearly a quarter of a century the Wellcome Museum of Medical Science has been developing on these lines, and its value has been recognised both by teachers and students. Such a system carried out in the hospital museums, on however modest a scale, would have many advantages, for the hospital museum is always at hand and medical students have little time to spare. A complete picture could be presented of the more important diseases, but such exhibits would not replace the excellent regional collections found in most hospital museums at the present time. The process is capable of almost infinite expansion, and (where space and funds permit) ætiology, prevention, and treatment might be included, with a survey of recent experimental work. In considering the diseases of tropical countries a review of the disease in all its aspects is especially desirable. Moreover, such diseases lend themselves to the pictorial method, and students are thereby enabled to study visually the problems of environment and transmission with their bearing on prevention. Colour photomicrography can present a very perfect picture of the parasites in all stages of their development, and by such a method the finest specimens can be shown to students. Museums of this kind will naturally be closely associated with the schools of tropical medicine, in the same way that museums dealing with hygiene should be closely linked with the special schools which train for a diploma in public health. Museums dealing with the history of medicine also come into a special category. An ambitious scheme has been drawn up for the future development of the Wellcome Historical Medical Museum which should help to fill a regrettable gap in the medical education of this country.

The wastage of valuable specimens from the post-mortem rooms is often deplored: there is also a store of buried treasure in the photographic and X-ray departments of which little use is made. The selection, classification, and preservation of such material for teaching purposes may well be an additional function of the up-to-date museum, while a collection of lantern-slides and 16 mm. films recording clinical conditions and surgical technique might be added as opportunity offered. There is increasing demand for such visual aids to teaching, and extension in this direction would increase the value of the hospital museums of the future.

The future thus seems likely to bring an increase in the use of medical museums and a widening of their scope on the lines indicated. With the rapid progress in medical knowledge some rallying-point is needed where students, lecturers, and practitioners can survey the whole field of medicine and obtain information about recent developments. Museums of the three types mentioned are in a unique position to carry out this work. A museum should not be a depository but a workshop, and its value must be judged by the practical use made of the facilities which it provides for education and research. Moreover, as HIPPOCRATES wrote more than two thousand years ago "Much waste of time would be avoided if physicians began their researches by studying what the ancients have done before them."

REMUNERATION OF GENERAL PRACTITIONERS

THE committee set up by the Minister of Health and the Secretary of State for Scotland to advise on the range of total professional income of general practitioners in publicly organised services is inviting evidence from a number of organisations, but will also be prepared to receive evidence from interested bodies or persons other than those specially invited. Those wishing to place their views before the committee should submit memoranda to its joint secretaries at the Ministry of Health, Whitehall, London, SW1, before the end of April.

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Annotations

MEDICAL SERVICE FOR CHILDREN

THE provisions of the Education Act, 1944, are to come into force on April 1, when local education authorities must implement section 48 (3), which makes it their duty to arrange for the provision of free medical treatment, other than domiciliary, for all pupils attending schools or county colleges maintained by them. The Ministry of Education circular of March 12, which outlines the scheme, follows the lines of the explanatory memorandum [1] issued by the Board of Education in January, 1944. Whatever is the fate of the National Health Service, there is to be a free and comprehensive service of medical treatment for all children between the ages of 2 and 18 years attending schools within the State system. It is true that visits of the general practitioner to the child's home will not be included, but the local education authority may, if it wishes, arrange for treatment at a doctor's surgery.

Every local education authority—under the Act the county and county-borough councils—must now work out a scheme to cover the full range of hospital and clinic treatment. The existing clinics for minor ailments, defective hearing, diseases of the ear, nose and throat, and eyes, orthopædic cases, dental treatment, child guidance, speech therapy, and rheumatism, which have been further developed in some areas than in others, must be revised and where necessary extended and strengthened. This will mean securing the services of more consultants—aurists, ophthalmic surgeons, dermatologists, and specialists in children's diseases. Another necessary reform, not mentioned in the circular, is the desirability of all whole-time medical personnel in the school medical service undertaking active duties in a children's department of a hospital for some part of their time, whether as a clinical assistant to the hospital pædiatrician or as a registrar with beds to supervise. Arrangements for hospital treatment are to be comprehensive provided it is confined to children referred to the hospital by the education authority, or children for whose treatment the authority has accepted responsibility. Authorities are likely to vary in the way they go to work under this definition, but two things seem desirable. First, having established its scheme, the authority should authorise private doctors to send any child who comes within its scope direct to a hospital or clinic for treatment, without any formal acceptance of each case, which would cause delay and irritation. Secondly, in framing its scheme the authority should specify hospitals at which treatment can be given at the authority's expense; clearly not every hospital is staffed and equipped to deal with all conditions, and the authority must ensure that children requiring special treatment do come under the care of a specialist. The circular suggests that in rural areas without clinic facilities arrangements should be made with local general practitioners to treat children referred by school medical officers or nurses, either in the schools or in the doctors' own surgeries; it is not clear how this will work out when the family doctors practising in an area are not in partnership. The same arrangement is suggested for dental treatment in areas where clinic facilities are lacking.

While the war lasts, and for some time afterwards, progress towards a comprehensive medical service for children will unavoidably be restricted by the shortage of civilian doctors, dentists, and nurses; and when a National Health Service is in full swing the children's service will be absorbed into that. But in issuing their circular the Ministry of Education are clearly encouraging local authorities to make the best provision they can for children in the interim period.

1. See *Lancet*, 1944, i, 153.

SHOCK TREATMENT AS AN EXPERIENCE

THE doctor cannot explain how physical methods of treatment can restore a patient to sanity; neither can the patient give a clear account of the change that has meant so much to him. At a meeting of the section of psychiatry of the Royal Society of Medicine on March 13, Dr. J. Frank described what he has been able to discern, either from patients' reports, or from his own observation, of the experience of those undergoing treatment by artificially induced fits or prefrontal leucotomy. Pharmacological shock, by insulin or leptazol, and electrical convulsion therapy (ECT) are being given on an increasing scale, not only for psychosis but for psychoneurosis; and prefrontal leucotomy is being tried in cases of hypochondriacal neurosis, severe obsessionalism, and aggressive psychopathy. The fact that the same artificially-induced fits may bring a change for the better in the manic-depressive, the schizophrenic, and the neurotic, means, he suggested, either that there is some common denominator in these conditions or that the change is due to the subject's experience of the convulsion.

In 650 cases treated by ECT at Graylingwell Hospital the best results were obtained among those depressives who showed a common denominator in physical signs such as motor retardation, loss of weight, anorexia, insomnia, and constipation. Conscious reactions among these patients were scanty. They were a little confused for an hour or two after the fit; and if the confusion lasted longer than that he suspected cerebral arteriosclerosis. They had little deep insight into their previous condition: "I don't know why I felt like I did, or thought such terrible things; but I'm all right now, and know my thoughts were wrong." Dr. W. Mayer-Gross, touching on this point in the subsequent discussion, remarked that the rational conscious insight of depressive patients is good. The treatment changes them, and after the change they are naturally unwilling to dwell on their former condition. Certainly deep analysis is out of the question soon after treatment, being liable to provoke a relapse. As Dr. Frank pointed out, the doctor must accept a paradox: before treatment the depressive patient cannot be analysed because he is incapable of transference, and after treatment he is capable of transference but cannot take the strain of analysis. His doctor's task is thus only to provide him, during recovery, with as apt an environment as possible, both in the wards and after discharge. A good group spirit in the ward, and association with other recovering patients, will do much for him.

Retrograde amnesia covers the short preconvulsive aura in ECT; nevertheless all patients dread the fits—depressives, however, less than psychoneurotics. Yet fear of the fit cannot of itself be held responsible for the improvement, as Dr. L. C. Cook made clear in the discussion. In 275 cases he had assessed overt apprehension, and found that out of 11 showing gross fear, only 1 improved; of 56 showing moderate fear 18 improved; of 61 showing little fear 21 improved; of 95 showing a normal reaction 47 improved; and of 52 showing undue indifference 24 improved.

Maniacal reactions after the fit are uncommon in depressives, Dr. Frank said, though many have a sense of euphoric well-being—which they do not usually connect with the treatment unless the idea is suggested to them. Little as they like the fits, they turn up regularly for them, as outpatients; whereas psychoneurotics tend to fall off. He found no evidence, in the dreams or fantasies of depressives, to indicate that this perseverance sprang from a desire for self-punishment: on the contrary, after 4 or 5 fits their sleep became restful instead of disturbed, whereas psychoneurotics often had nightmares of train crashes, flood and fire, which might be a compulsive recapitulation of the fit itself.

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Recovered depressives are apt, he finds, to express their gratitude for convulsion therapy with a good deal of shallow and insincere politeness. He puts this down to a "fading of colour" of the personality comparable with that seen after leucotomy and severe organic deteriorations, but with the difference that after a couple of months the dimming effect of ECT passes off, and the personality recovers normal vividness. Depressed patients treated with leptazol are able to recall terrifying preconvulsive auras of annihilation which seem to last endlessly, though in fact they occupy only 15–30 sec. These patients often mime repressed memories immediately after the fit, but this, he finds, does not help them: they are not suited for the conveyor-belt of fit treatment.

Insulin treatment produces a curious type of awakening in about 80% of patients: they talk in an infantile manner for a time, and seem to recapitulate the early phases of emotional development. He spoke of the "warmth and congruity of affect," produced by insulin coma in nuclear schizophrenics, as a remarkable achievement.

Experience of leucotomy is especially odd: even in patients of high intelligence with well-preserved personalities, the operation seems to have less subjective significance than an appendicectomy. A doctor and a medical student so treated had little notion of the theory of the operation, or even its site, though they had discussed it beforehand, and saw the scars daily. Dr. Mayer-Gross suggested the need for animal experiments in the further study of these methods of treatment; but no-one raised the question of human volunteers of normal mentality. It might be difficult to find candidates for leucotomy, but some normal opinions about the effects of induced fits have already been recorded.

BLOOD IN THE EYE

AFTER a blow on the eye with a blunt object it is not uncommon to find blood in the anterior chamber. This blood comes from a ruptured iris vessel, and the hæmorrhage may be repeated in a few days. Blood-cells normally leave the anterior chamber by entering the iris crypts, and thence by way of the iris stroma reach the suprachoroidal lymph-space and vorticose veins. In a slight hæmorrhage all the blood may have left the eye by this means in a few days, but if the blood is sufficient to raise the tension of the eye this normal line of evacuation will be closed owing to pressure against the unyielding fibrous tunic of the eye, and blood-cells or their remains may be driven between the corneal lamellæ to form blood-staining of the cornea. This is a serious affair, for such staining only clears very slowly if at all, and an eye so affected will certainly not regain its sight in less than two years.

Philps [1] has shown that blood-cells, if not evacuated from the anterior chamber, may remain there intact for months or even years; and this is not surprising, for aqueous humour and blood plasma do not differ greatly in their composition. Where the iris crypts have been destroyed or become blocked by inflammation blood-cells leave the anterior chamber slowly if at all, and do not travel by the canal of Schlemm in any quantity. Unless the hæmorrhage is very small the blood clots, and then the process of removal cannot begin until the fibrinous elements entangling the cells have been dissolved by the aqueous humour.

Rychener [2] advocates paracentesis of the anterior chamber in every hyphæma which completely fills it. It is not necessary to evacuate the blood-clot; indeed it is unwise to make too strenuous efforts to do so; and the lessening of the ocular tension produced by the operation will have the desired effect of re-starting evacuation of blood-cells by the normal route. In 13 patients with traumatic hyphæma and raised intraocular pressure Rychener has now used this treatment with satisfactory results. Formerly atropine has been used in these eyes to ward off the accompanying iritis, but there is a good case for using a miotic such as eserine instead. The increase in tension caused by the blood is further augmented by atropine, and in addition the surface area of the iris—and therefore its power to absorb blood-cells—is diminished by this drug. It seems therefore wiser to use eserine until the blood is absorbed, and then atropine until the eye is white.

1. Philps, S. *Brit. J. Ophthal.* March, 1940, p. 122.
2. Rychener, R. O. *J. Amer. med. Ass.* 1944, **126**, 763.

NORWAY'S DELINQUENT CHILDREN

SOME of the trials of community life are universal, and among them the child corrupted by evil communications is specially disquieting. Remedies have varied in different times and places: the Greeks, with some prejudice, killed Socrates; savage tribes, without prejudice, kill the child; while modern civilised opinion is in favour of changing the teacher and giving the child a fresh start. An account, by Ragna Hagen,[1] of Norwegian ways of dealing with neglected and problem children has some pointers for us. The opening quotation is significant:

> "It is curious to note that it is precisely the turn of the century—that is to say, the time when the care of neglected children by Child Welfare Councils was first instituted—which seems to have brought a change for the better in criminality among young men."—Norwegian Criminal Statistics, 1923–24.

The law which set up these councils, passed in 1896 against much opposition, stopped the punishment of children by ordinary courts of law: instead, those who committed punishable offences were to come under the care of a welfare council composed of the local judge, a member of the clergy, and five men and women elected by the municipal council of the district. In the larger districts several doctors and clergymen may take it in turn to serve, according to the chairman's direction. There has been a growing movement, in recent years, to include in the councils young men and women with modern training in the treatment of children. The councils conduct their investigations in private, no press reports being allowed. They are intended to prevent crime and to alter conditions acting unfavourably on the child. Before the meeting the child's home conditions are studied by a member of the council and a permanent secretary; this corresponds to the study made by the probation officer for children's courts in England. Reports are obtained from the police, the school, and the poor-law relief authorities, and the council member visits the home and tries to get at the root of the trouble by talking to the parents and the child. Often the family needs direct help—better accommodation, or work for the father. In 1939, among 959 cases (affecting 1668 children) dealt with by the councils, home conditions were wholly or partly to blame in 565.

Legally the councils have jurisdiction over children up to the age of 14; but in practice it is customary to leave the treatment of all children up to 18 in their hands. They have several ways of catering for the needs of children brought before them. They can supervise them in their own homes, place them with a responsible family, or send them to a residential home. If the child has committed a punishable offence he can be sent to a school home—presumably corresponding to our approved schools—of which there are four for girls and seven for boys in Norway. Further, children aged 7–15 can be sent to institutions with the forbidding name of "coercive schools" for up to a year; after that they either go home, or, if they need further discipline, to a school home. The results seem to resemble those of English

1. *Howard J.* 1944–45, 6, 187.

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approved schools. Nothing unfavourable is heard of 85% of girls after they leave school homes; the percentage of equally successful boys is stated to be lower. A Home Office inquiry made before the war showed 84% of children leaving our approved schools were satisfactory three years after leaving. It would be interesting to know whether the proportion of children committed to the Norwegian schools by the child-welfare councils corresponds to the proportion sent to approved schools by our own children's courts.

THE NURSE'S PENSION

THE reforms needed in the nursing profession are subject to much debate, but on one point all authorities agree—the nurse should have pension rights, and these should be interchangeable when she transfers her service from one employing body to another. The committee which has just reported [1] has had these aims. An estimate of the numbers to be covered puts the total of all nurses and midwives in England, Wales, and Scotland at 140,421. Of these, at the time when the figures were compiled, 91,427 were working in hospitals (whether as students, assistant nurses, or fully trained staff), 25,983 were working outside hospitals (including 15,222 in private practice), and in addition there were 16,483 midwives and 6528 health visitors. It has been thought necessary to leave out private nurses and industrial nurses from the scheme recommended, nor are nurses in the Services considered. The report reviews the two main existing superannuation schemes—the Federated Superannuation Scheme, operating in those voluntary hospitals which choose to apply it, and the Local Government Superannuation Scheme, which is compulsory in all local-authority hospitals. The committee thinks it impossible at present to provide a comprehensive scheme to supersede both of these, but one member dissents from this view, and Prof. T. M. Taylor, chairman of the Scottish committee, says that he accepts the report with reluctance, in the hope that it will be replaced by more satisfactory proposals later.

The report recommends that the local-government scheme should be left unchanged, but that a separate fund should be set up to cover all nurses and midwives in voluntary hospitals and institutions where the Rushcliffe and Taylor salary scales have been adopted. These nurses would be obliged to join the fund unless they were already contributing to the Federated Superannuation Scheme, and chose to remain under it; this scheme would also remain available for nurses outside the scope of the new fund. Plans have been made by which a nurse who changes from voluntary to municipal service, and vice versa, shall not suffer loss of pension; and the benefits offered are similar to those of the local-government scheme.

> A nurse will qualify for a pension after a minimum of 10 years' contributing service. She will have the option of retiring at 55, or after 30 years' service; and retirement will be compulsory at 60. The pension is to be based on the average salary and emoluments of the last 5 years of service, and to be at the rate of $\frac{1}{80}$th for every year of contributing service. Pensions are to be paid for permanent incapacity on the same basis as for age provided the nurse has completed 10 years' contributing service.

In a series of examples at the end, the report indicates how the scale will work out in various cases. Thus a nurse who qualifies and remains a staff nurse all her life—an exceptional case—will get a pension of about £140 a year if she retires at the age of 55; if she had become a ward sister at the age of 30 she would get about £173 at 55; if she rose to the position of matron she would get £365. These pensions are not dazzling; but they may well be the best that can be managed at present. The nurse is not being rewarded according to the deserts of a life of hard work and little leisure, but only according to the standards which our confused economic system allow. In suggesting that calculations should be based on the last 5 years' salary, rather than on contributions made, the committee has chosen a method which will encourage nurses to leave the position of ward sister for better-paid posts, and in this the report follows the trend of all the Rushcliffe and Taylor reports, which have consistently slighted the most important office in hospital nursing.

1. Nurses and Midwives Salaries Committees (England and Scotland): Report of Joint Superannuation Subcommittee on Superannuation of Nurses and Midwives. Cmd. 6603. HM Stationery Office. Pp. 51. 9d.

CONGENITAL DEFECTS OF THE PERICARDIUM

DEFECTS of the pericardium are among the rarer of the congenital defects of the heart; less than 60 cases have been recorded and 7 of these were in monsters. Sunderland and Wright-Smith [1] report 2 more, neither being diagnosed during life. One was a child of two years who died suddenly; at necropsy a large defect was found in the left side of the parietal pericardium, and death was due to herniation of the heart through this defect; in addition there was a patent ductus arteriosus. The other was a man of 61, who died of bronchopneumonia after a hemiplegia; necropsy revealed a large defect of the pericardium, and the right lung was found to have four well-defined lobes. It is generally accepted that these defects are due to obstruction of the normal development of the pleuropericardial membrane, but there is considerable difference of opinion as to the precise mechanism whereby this takes place. Sunderland and Wright-Smith suggest that one or more of several factors may be responsible. Premature or abnormal enlargement of the heart before the closure of the pleuropericardial foramen would prevent closure of the foramen by herniation of the heart through the opening. If there is an abnormally large foramen when the heart starts enlarging normally the foramen will not have an opportunity of closing subsequently. Delayed or arrested development of a normal pleuropericardial foramen may occur, either from defective formation of the pleuropericardial membrane as a result of premature obliteration of the duct of Cuvier, or from diminished activity of the differential growth factor by which the connexion between the pleural and pericardial cavities is gradually reduced to a minute foramen. Rusby and Sellors,[2] on the other hand, in reporting a case in a girl of 19 in whom the left-sided pericardial defect was accompanied by a solitary bronchogenic cyst on the same side, consider that the association of these two defects supports the view that the pericardial defect is the result of abnormal development with premature atrophy of the left duct of Cuvier.

Males have a congenital pericardial defect three times as often as females, and according to Southworth and Stevenson [3] it has no appreciable effect on the expectation of life. In only one case, apart from the one recorded by Sunderland and Wright-Smith, could death be attributed to the defect; this was a case described by Boxall [4] in a woman who died suddenly three days after parturition, in whom necropsy demonstrated a pericardial defect through which the heart had herniated and become strangulated. Excluding cases where enlargement was due to associated cardiovascular disease, the heart is recorded as being enlarged in about half the cases. The condition seldom gives rise to symptoms, but in cases where there is a common pleuropericardial cavity on the left side (the common side for the defect) unexplained displacement of the heart to the left and abnormal mobility of the heart may be helpful in diagnosis, especially if in addition there is unexplained cardiac enlargement.

1. Sunderland, S., Wright-Smith, R. J. *Brit. Heart J.* 1944, **6**, 167.
2. Rusby, N. L., Sellors, T. H. *Brit. J. Surg.* 1945, **32**, 357.
3. Southworth, H., Stevenson, C. S. *Arch. intern. Med.* 1938, **16**, 223.
4. Boxall, R. *Trans. Obstet. Soc., Lond.* 1887, **28**, 209.

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Special Articles

BICENTENARY OF J. P. FRANK

ON March 19 just 200 years ago was born Johann Peter Frank, famous in his own day as clinician, teacher, medical organiser, and physician to three emperors, but significant to our own age mainly as the founder of social medicine and hygiene.

Frank's great work, the writing of which occupied the spare time of almost his whole working life, is entitled *System einer vollständigen medicinischen Polizey* and appeared at intervals from 1779 to 1827, in eleven volumes, the last two supplementary volumes being published posthumously. In it he laid the scientific foundations of public health and its independence as a subject of medical education. Professor Mackintosh,[1] in his inaugural address at the London School of Hygiene and Tropical Medicine last June, pointed out that Frank's influence had some part in the foundation of the first chair of public health in Great Britain, at Edinburgh in 1803. The *System* is written in Frank's mother-tongue, German, but he prepared the way for it in three short Latin treatises, all of which have been translated into English for the first time within the last 10 years.

In the first of these, *Epistola invitatoria ad eruditos, de communicandis, quae ad politiam medicam spectant, principum ac legislatorum decretis*, Mannheim, 1776, translated by Barnard,[2] he outlined the plan for his work and invited learned men throughout the world to help him by sending copies of any government decrees relating to hygiene. In the second treatise, *Dissertatio de magistratu, medico felicissimo*, Göttingen, 1784, translated by Sabine,[3] Frank expounds his theory that the civil administrator by appropriate legislation can achieve for the public health what is impossible to the physician. The last of this trio, *Oratio academica de populorum miseria, morborum genetrice*, Pavia, 1790, translated by Sigerist,[4] is a stirring exposure of the poverty and wretchedness of the populace in his own time and the influence of these conditions in the causation of disease. These three treatises give us an indication of the idea underlying the whole of his great work, an idea expressly and significantly stated in one sentence in the preface to the *System*: "Diese hingegen giebt sich jetzt, um Hülfe zu schaffen, mehr vergebliche Mühe, und verwendet mehr Geld in einer Woche, als von beyden nöthig wäre, dem Uebel durch kluge Ordnung vorzubeugen" (It [the government] at present, in order to get help [in curing disease] gives itself more vain trouble, and spends more money in a week, than would be necessary to prevent the evil by wise ordinance).

A GROWING REPUTATION

References to Frank in the medical literature of the last two centuries give some indication of the changing fortune which his reputation has undergone. They number less than a hundred all told—hardly an excessive tribute to so great a man. During his lifetime they consist, understandably enough, exclusively of reviews of his published work.

In the 40 years following his death in 1821 we have found only eight, one in Italian, one in French, the remainder in German, almost entirely biographical in nature. The next 30 years produced over a dozen, all German, mostly dealing with special aspects of Frank's work, such as glycosuria and his theory of the vertebral nature of the skull. Public health also appears for the first time. In the last decade of the 19th century there appeared three contributions, one each in German, Russian, and French, the first commemorating the 150th anniversary of his birth, the last-named dealing with his therapeutics.

The thirteen publications in the first twenty years of this century are all in German and discuss a variety of topics: hygiene, neuropathology, and eugenics, besides the more personal aspects. In the 1920's there was a sudden increase of interest in Frank, and English contributions (two American and two British) appear for the first time among the seventeen items of this decade. There are also two in Italian and one in Russian. All are of a general or biographical nature. From 1930 to 1939 there are no less than twenty-one references, including four English (two American, two British), mostly biographical, but some also of public health interest. Since 1940 there have been at least three references in the English literature: owing to war conditions we cannot be sure what has appeared on the Continent.

We see therefore that it was nearly 80 years, judging by the literature, before Frank's significance in public health was recognised, and a full century before his fame spread to the English-speaking world. Now that his name appears amongst those carved in stone round the walls of the London School of Hygiene and Tropical Medicine it is not likely to be forgotten again.

THE REFORMER

Only a few of the innumerable proposals that crowd Frank's pages can be mentioned here. He was a great believer in vital statistics at a time when they were almost unknown. All births and deaths were to be registered and the causes of death classified. Surveys were to be made of the prevalence and geographical distribution of poverty and disease, and the interrelations of the two studied. In his proposals concerning marriage Frank was a pioneer of eugenics. Many of them are still too "advanced" for general acceptance even today—e.g., the legal fixing not only of minimum but also of maximum ages for marriage, compulsory premarital examination, and the prohibition of marriage to those afflicted with hereditary diseases. Marriages of free choice between well-matched and healthy couples were to be encouraged and their prohibition by parents made illegal.

The reform of midwifery being one of the outstanding practical achievements of Frank's life, his suggestions in this and the related subject of infant welfare are naturally detailed and well founded on experience. All pregnancies were to be registered and "follow-up" records kept; breast-feeding, in the absence of any contra-indication, was to be compulsory; and all infants admitted to foundling institutions were to be inoculated against smallpox (this was 13 years before Jenner's discovery of vaccination). School hygiene was also very thoroughly handled: school hours to be restricted, and the size, situation, heating, ventilation, and illumination of school buildings controlled. Proper sanitary conveniences were to be provided.

Frank recognised the evils of intemperance but did not advocate total abstinence. Inns were to be inspected and the manufacture and sale of intoxicating liquors controlled. Drunkenness should be a punishable offence and the use of tobacco prohibited before the 20th year. Writing a century before Pasteur, Frank deplored the fact that the true nature of infection was still unknown. His section on communicable diseases is in consequence unsatisfactory, but his proposals on the subject of food inspection are probably more in line with modern legislation than almost any others. To a less extent the same is true of housing, refuse disposal, and water-supply.

Although Frank, a true child of the 18th century, favoured a benevolent despotism as the ideal form of government, and the growth of democracy has made many of his proposed laws impossible to enforce in the somewhat naïve forms he suggested, it should not be forgotten that it was he who originated the idea of improving the public health by the method of wise legislation.

C. C. B.

1. Mackintosh, J. M. *Lancet*, 1944, ii, 1.
2. Barnard, C. C. *Janus*, 1935, **39**, 149.
3. Sabine, J. C. *Bull. Hist. Med.* 1944, **16**, 289.
4. Sigerist, H. E. *Ibid*, 1941, **9**, 81.

MEDICINE AND THE LAW

Unlicensed Establishment for Diathermy Treatment

SOME day, when the Ministry of Health has time to turn from large-scale legislative problems of local government and water-supply to the minor adjustments of public health, the special local restrictions on establishments for electrical and diathermy treatment might well be extended to the whole country. At present the big towns, and a few county councils like that of Middlesex, purchase the right to control them by way of a Local Act procured at the expense of the ratepayers. Meanwhile in those areas where the law forbids such establishments anyone who infringes the law is unlikely to be doing so in ignorance. Recently, on summonses by the London County Council, Henry Lewin and Louis A.

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Newton, MRCS, trading as the "Newin Clinic" at 48, Portland-Place, London, have each been fined £10, with ten guineas costs, at the Marlborough Street police-court, for carrying on an establishment for short-wave diathermy for deafness without an LCC licence.

Mr. J. S. Atherton, prosecuting, mentioned that in September, 1942, Dr. Newton was found guilty by the General Medical Council of giving false certificates to enable three persons to evade their obligations under the National Service (Armed Forces) Act, and his name was erased from the Medical Register. In January, 1944, Mr. Lewin wrote to the LCC notifying his intention to reopen an establishment in London in partnership with a doctor not then on the Register, and he asked about their position with regard to a licence. A form was sent to him and in February the two defendants applied to the Council for permission to give electrical treatment, light and other baths, and long-wave and short-wave diathermy at Portland Place. They were informed that the Council were not prepared to grant permission, and they withdrew their application. Later advertisements appeared in the press announcing that diathermy treatment would be given at the clinic, and when the defendants were interviewed they admitted that they were giving 40–50 treatments a week, and said that as they were not giving massage treatment they were advised that the LCC had no authority over them. Mr. Atherton added that Mr. Lewin had previously had clinics at Cheltenham and other towns.

Mr. Edgar Rodwell, the solicitor defending, urged in extenuation that they had been advised that as Dr. Newton had medical degrees, although he was not on the Medical Register, it was not necessary to apply for a licence. Mr. Walter Hedley, KC, the magistrate, said it was quite obvious that they both knew they had to be licensed and that they wilfully disregarded this fact because they could not get a licence. At the same time, as there had been no complaints about the clinic, he should treat this as a comparatively minor matter. If the offences were repeated he would have to take a more serious course.

Judicial View of Lax Certification

In 1941 a woman wanted to leave her employment at the Clyde Rubber Works in Scotland and, for this purpose, asked a doctor for a medical certificate. He gave her a certificate to the effect that she told him she suffered from frequent sickness on account of the nature of her work and that he himself had no reason to doubt what she told him. On this the national service officer gave her permission to leave her employment. Soon afterwards the managing director of the rubber works wrote a letter to the doctor which the doctor alleged to be defamatory. A few days later an appeal board recommended that the national service officer's decision should not be accepted; the permission to leave was withdrawn and the woman went back to her old work. The doctor claimed £500 damages from the managing director in respect of the letter; he contended that it contained a malicious accusation of something amounting to treason, since in effect it charged him with being party to a course of conduct which sabotaged the war effort. The sheriff-substitute at Paisley (a tribunal roughly corresponding with a county court in England) dismissed the claim for damages. He held that the writer of the letter had acted without malice and that the occasion was privileged. Incidentally he criticised the certificate given by the doctor as well as the medical evidence tendered in support of the claim at the trial.

On appeal to the Court of Session in Edinburgh, the Lord President upheld the opinions and the decision of the court below. He agreed that the letter substantially complained of loose practice rather than of deliberate purpose. The Lord President added that he appreciated that in 1941 doctors were over-driven and harassed by applications for medical certificates on behalf of persons who were trying to escape from the duties imposed on them by the country's necessities. Apparently some practitioners had slipped into a loose way of granting certificates which were not in accordance with their usual and better considered practice. "I am glad to say," observed the Lord President, "that the medical profession at large became aware of this unfortunate development, and steps were taken to rectify it."

In England Now

A Running Commentary by Peripatetic Correspondents

Prof. L. J. Witts, broadcasting on March 11 about fibrositis, told us how, after recovering from a cold, he went to London and got food-poisoning, and, recovering from this in bed beside an open window on his left, forgot the draught until he developed a pain in his left shoulder. There, he suggested, you have all the ingredients of an attack of fibrositis. Then he reminded us that Pettenkofer drank a culture of *Vibrio cholerae* and did not get cholera; so a susceptible person is also required. Witts then remembered that others of his family have had rheumatism and discussed the incontrovertible fact of hereditary predisposition. Under the comforting influence of radiant heat he also remembered that some think the mind is a factor in the causation of disease. Thoughts and emotions, he seemed to agree, are causes, though not the only ones, of illnesses such as hysteria and morbid anxiety; but he found it hard to believe that structural changes in the body can be brought about by the mind. Between these two extremes, however, there are diseases which many believe to be affected by the mind, such as eczema, asthma, and rheumatism. He mentioned the views of J. L. Halliday (see *Brit. med. J.* 1937, i, 213, **264**), who collected a series of cases of fibrositis of the neck and shoulder, mostly on the left side, and maintained that the left side is associated in the collective unconscious with disaster and misfortune, and in saga and myth with the magical and demoniacal, while the right signifies the good. Pain in the neck, says Halliday, may mean, in a psychoneurotic person at any rate, "I cannot bow my head to this"; lumbago may mean, "I do not stoop to do these things"; generalised pains and stiffness may mean "I am sore about what has happened to me." Grief, whose physical manifestations are temporary, may persist in some individuals so that the chokings and sobs become asthma and the soreness and stiffness become rheumatism. Witts remembered that a childhood friend had recently died and another friend had broken his arm; but he found it hard to believe that the mind could affect the cells concerned in fibrositis or determine the point of attack of that disease. And any bookie listening would, I feel sure, have offered 100 to 1 on the draught.

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I was lucky enough to be taken round the notorious "torture-camp" of Breendonck by a prominent Belgian editor who had himself spent over a year there as a prisoner, on the (justified) suspicion of being a power behind several clandestine newspapers of the "Resistance."

The camp is in one of the underground 18th century forts which constituted the outer defences of Antwerp, even in the last war. The approaches contribute an appropriately macabre background to what was only a month or two ago one of the blackest spots on the "civilisation" of Europe. After passing through several lanes of electrified barbed-wire we crossed the moat by the ancient drawbridge and passed down the narrow, almost dark, cobbled corridor which leads at a gentle angle down into the centre of the fort. On either side of this are the guard-rooms and the stone-flagged unheated rooms, each of which held fifty or more of the luckier political prisoners. Further on are the solitary cells, each measuring 5 × 4 feet, in which were confined those under interrogation or condemned to death. These have no communication with the outside light or air.

My friend then led the way to the torture chamber, a large room with damp stone walls and no windows. There were no furnishings other than the long wooden table on which he had himself been beaten, a hook in the ceiling, and a narrow channel in the floor which he said was to carry away blood. The hook was to support a rope by which prisoners who refused to talk were suspended by their wrists, which were first passed backwards between their knees so that they hung head downwards. This permitted them to be dropped suddenly on to their heads as often as their interrogators wished. For the usual preliminary "aid to conversation" however no apparatus was necessary, since it consisted in pushing a sharpened match-stick under each finger-nail and allowing it to burn down.

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Full confirmation of these and other gruesome details came unexpectedly while we were still in this chamber in the form of a "pilgrimage" of some thirty or forty "old boys" of this prison, all employees of the State postal service who had been caught or suspected of tampering with the Gestapo's mail. As they had mostly known my companion, there was an orgy of hand-shaking, embracing, chattering, and even weeping, such as can seldom have been known. It seemed evident that the old-school-tie spirit is in essentials the result of unpleasant experiences shared in the past, and that any class association is probably incidental rather than fundamental. This may perhaps explain why it seldom affects the product of schools, such as those provided by a benificent State, in which corporal punishment is frowned upon.

We spent an hour with these newcomers, listening to their reminiscences and looking at their photographs. Dysentery they told me was rife, but the prison rule of a visit to the lavatory twice a day only was never relaxed, and when they died, as they often did, their soiled clothes were handed on to new entrants in the state in which they were left. Apart from prisoners officially condemned to death, fifteen chosen by lot were in addition shot every week *pour encourager les autres*; and my host's 12-month sojourn was therefore, they assured me, almost a record.

Leaving, we passed the courtyard at one end of which still stand five railway sleepers to which victims were tied to be shot. In one corner stands a gallows. Looking back across the moat at this horrible place there was a sudden flash of blue as a king-fisher skimmed past, and I think that we were both grateful for this relief.

The full story of such places will never be fully believed by the good-natured peace-loving people of Britain—whose country has never been occupied. Perhaps it is as well.

* * *

Mess life has varying effects on the habits of the individual. At times for weeks on end he will seize a particular armchair and solemnly read through a set series of periodicals; at others he will haunt the billiard-room, occupying, or interminably waiting for, one or other of the tables, or perhaps knocking up at table-tennis to fill in the gap. But recently a long-forgotten warped shove-ha'penny board was found in a drawer of a condemned table. Someone produced five ha'pennies of the same vintage and had them "faced up" in the workshops. Someone else cleaned the board with ether and disclosed a beautiful piece of even-grained teak. The carpenter's shop levelled it and made a cover—and we were off.

I don't know by what mechanism, and prefer to think that the gentle touch of the surgeon or physician played its part, but undoubtedly the best players were found among the medical officers. Our supremacy has never seriously been challenged, although everyone from the CO downwards has made an attempt, and we are now generally left alone to play each other. An education officer put his own special seal on the matter by organising a knockout competition on handicap. This teacher's zeal to examine our competitive spirit was, remarkably enough, well received—particularly as a sweep was included. Handicapping is not easy at shove-ha'penny, but we adopted the official method. Did you know there is a S-H Association, like the LTA, the AFA or NFA? The semi-finals and finals were incredibly played under verbal fire of pretty nearly the whole mess. Excitement at times was intense, and the last successful ha'penny finding its snug place fairly between the lines was a welcome relief suitably displayed in the applause. Modesty as well as anonymity forbid naming the victor.

But our educational friend had not exhausted his schoolmastering passion for exciting competition, and instituted a shove-ha'penny "ladder." Our lunch hour is now fervid with strife, and men with knitted brows and scornful expressions (when viewing the flukes of their opponents) are always to be seen standing round the table bearing the shove-ha'penny board. I often wonder what visitors must think of the solemnity with which we attach ourselves to these five coins of low degree and a piece of wood; but I cannot feel that our behaviour is more feeble-minded than that of the rest of the world, where mutual extermination, in however just a cause, is the main preoccupation.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

THE address delivered by Mr. Churchill to the Conservative conference brings the time and method of a General Election into clearer focus. We may, according to the Prime Minister, achieve complete victory over Germany by the summer or earlier. An election will follow that victory. There will be an interregnum when Labour and Liberal members of the Government withdraw from the Coalition and Mr. Churchill forms an interim Government to carry on until the election has been held; and in this Government Mr. Churchill will seek the help of men outside the Conservative party, or outside any party. He clearly hopes that the Conservative party, getting the majority of seats, will be able to carry on some kind of coalition in the future. The basis of this coalition would be the Four Year Plan announced by the Premier some two years ago which includes the projected Social Security legislation and the National Health Service. As these projects will certainly be included in the Labour programme if Labour is victorious the nation seems now to be pledged, whatever Government is in power, to diluted or undiluted Beveridge, with the accent on health services.

The event of this week in Parliament was Sir J. Grigg's speech in presenting the Army Estimates. He had a great story to tell, and, speaking of all our Forces, those in North-West Europe, Burma, and Italy, he said "we have a magnificent Army." The Army has perfected itself by a long process of rigorous training and is equipped as no Army before. Confident in its own strength "it is assured of final victory both in the West and in the East."

It was made clear that after the war with Germany is over there will be substantial demobilisation, but also a very complicated and difficult process of redeployment against Japan accompanied by a further call-up of those who have hitherto been in reserved occupations. Mr. Gallagher, the Communist member, revived the general demobilisation issue in an amendment—a usual formula on the Service estimates—and asked for an advisory council of 5 officers and 10 ORs to be set up to help in fitting men into useful employment. The War Office cannot, he argued, on demobilisation, "pass the buck" to the Minister of Labour and say that the demobilised are no longer their concern. The War Office should be sure that there is a job to which the demobilised man can go.

In replying on the amendment Mr. Arthur Henderson said the principles of demobilisation depended on the objective standards of age and length of service. But retention on grounds of military necessity will override both age and length of service. He was interrupted to be asked whether "military necessity" would not adversely affect the chances of demobilisation of medical officers "as they are very scarce." And further as to whether he would make some adjustment to the scheme to make it possible for men of senior rank and low medical category to be released early. Mr. Henderson promised to have the suggestion examined.

Sir James Grigg, replying to the debate, said he had been reminded of one of the things he had left unsaid and undone "and that is to pay a tribute to the doctors and medical services." Speaking of the recent award of a posthumous VC to a lance-corporal of the RAMC he said, "I do not remember ever reading anything more heroic." There is no doubt, he continued, that the medical services "have been beyond praise in this war and the number of lives and limbs saved by doctors is almost beyond measuring."

FROM THE PRESS GALLERY

Guns or Butter?

IN introducing the Army Estimates in the House of Commons on March 13 Sir JAMES GRIGG, Secretary of State for War, said he would like to make clear to the House what were the military responsibilities for feeding the civil population in the liberated countries. The military authorities had come into this business, he said, for two reasons. First because the Commander-in-Chief must

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assure himself that his operations would not be hampered by disease and unrest among the civil population caused by lack of food and medical stores. Secondly because in the early phases of operations, the imports necessary to prevent disease and unrest must come as part of the military flow of supplies. It could not be a question of what we should like to give our Allies but of the utmost that could be procured and shipped in competition with military requirements not only in the theatre but all over the world.

Plans to supply the American Supreme Commander's needs in this respect had been worked out on a joint basis between Washington and London. Canada too had been closely associated in the provision of the supplies, and substantial contributions had been made from the stocks of the Ministry of Food. Over 300,000 tons of food for the relief of France, Belgium, and Holland had been provided since the beginning of operations in Western Europe, and deliveries were now averaging at ports in France and Belgium some 7000 tons a day. In Greece, up to the middle of February, the military authorities had provided between 150,000 and 200,000 tons of food, and in Italy, up to Dec. 31, about 1 million tons. But the provision of supplies was not enough to enable the people to be fed. In France, for example, the shortage and dislocation of internal transport had prevented uniform distribution. That shortage was, he hoped, being overcome, but he feared that when the parts of Holland now occupied by the Germans were freed there would be grave problems not only of internal communications, flooding, and mines, but also of shortage of local products to help out the imported supplies. And though we had got so far without disaster, he did not conceal from the House his fear that in the coming months the demands for foodstuffs for the liberated countries might become almost overpowering. In Germany itself there would be displaced persons not by their thousands but by their millions, who would look to the armies for food. The combined resources of the Allies might be strained to the utmost to prevent hunger and indeed starvation, especially if our victory came before the new harvest was gathered. The armies would do their best, but he must stress the magnitude of their task. It was only right that the military should shed these responsibilities in this matter as soon as the military situation permitted, and they were anxious for the governments concerned to take over the obligation for the procurement of the basic supplies, and to push on with the civil import programmes which would enable them to re-start their industries.

UNRRA was an organisation which he hoped would bring to post-war Europe material and moral help and support, but, broadly speaking, this help would come after the main military work was done at the invitation of the indigenous governments. During the military period, however, UNRRA might, by mutual agreement under the direction of the military authorities, carry out tasks which would otherwise fall on the military. Thus in Greece UNRRA teams assisted in the distribution of the food which the military brought in, and arrangements were being made gradually to hand over to UNRRA the whole relief scheme in Greece. It was hoped that UNRRA teams (recruited from representatives of various United Nations) would go into Germany under the military authorities to organise the reception, care, and repatriation of the displaced persons, and ultimately to take over the entire responsibility for them.

In the debate Dr. HADEN GUEST gave an account of his recent visit to the 21st Army Group. The astonishing smallness of casualties, the astonishingly high rate of recovery—by which men not only survived but recovered to pre-wounding condition—was, he said, a tribute to the efficiency of the medical service. It was not only that operations took place very shortly after men had been wounded. The whole method of coöperation of the medical services with the other services was so much closer, so much more on a footing of complete equality, that it had completely changed the health conditions and vitality of the army. The work of the hygiene services in giving the ordinary soldier a knowledge of how to keep himself fit was a wonderful contribution. In the last war the louse and scabies were an everyday affair; in this war they were practically unknown. Men got the opportunity to bathe and to change their clothing even under front-line conditions. In spite of adverse conditions trench foot, which was the bane of operations in the last war in Belgium and the Low Countries, for practical purposes did not occur in the British armies today. This was not because of some intervention of Providence, but because of the good organisation of the combatant forces which largely depended on the application of medical knowledge. He had come across an advanced surgical centre where operations were being performed by skilled surgeons, with all the apparatus of a modern operating-theatre and with the help of nursing surgical sisters, within half a mile of the fighting line.

Aids for the Deaf

In the House of Lords on March 14 the Duke of MONTROSE asked what progress had been made by the Medical Research Council towards the supply of standard national acoustic aids for deafened ex-Service men. He moved that in all large cities otological clinics should be set up as part of any national rehabilitation scheme for ex-Service men. He suggested that training centres for the deaf, the blind, and the limbless should be centralised. After this war we ought to be ready to train and treat at least 200,000 deaf cases. There were about twenty kinds of aids for the deaf, but their prices were exorbitant. He was sure that a national standard set could be provided by mass production at £5 and distributed on a national basis.

Viscount CLIFDEN, replying for the Government, said that the MRC electro-acoustics committee, which is investigating problems connected with the design of hearing-aids, would not be able to make definite recommendations until the end of this year. Another MRC committee was considering rehabilitating measures for the deaf. Up to January, 1945, the number of cases of ear disease attributable to service in the armed forces since the beginning of the war was approximately 5000—the Navy 500, the Army 3800, the Air Force 700. Some 65% of these would be unlikely to need lip-reading or hearing-aids. Of the remainder, recommendations by all surgeons for hearing-aids were less than 60 a year. The deafened ex-Service man was covered by the Disabled Persons Employment Act, and aids for hearing and the cost of their upkeep were supplied free of charge. During the past two years 120 had been supplied.

The Duke of MONTROSE said he had never heard a more disappointing official reply and would not withdraw his motion. The Earl of LISTOWEL said it was clear that the Government accepted full responsibility for the deafened ex-Service man, but there were not enough cases to justify setting up a clinic in every large town. The Duke of MONTROSE agreed to amend his motion and the Government then agreed that provision should be made for setting up approved otological clinics as part of any national social rehabilitation scheme for ex-Service men.

Paper for Medical Books and Journals

In the House of Lords on March 14, speaking on Lord Elton's motion calling attention to the lack of paper for books, Viscount BUCKMASTER urged that medical publications, in which he included journals and periodicals, were so restricted that it was difficult to see how the study of medicine could be pursued or how medicine could be practised in the manner which was expected. Two examples from the medical curriculum would show their Lordships that publishers were now quite unable to supply the basic minimum of books needed by medical students. *Gray's Anatomy* was unobtainable either in new or secondhand form. The same applied to *Buchanan's Anatomy* and *Cunningham's Anatomy*. In one physiology class 15% of the students could neither beg, borrow, nor by any means short of theft obtain a copy of any of the leading works. How could men pursue their studies under such conditions, and how could a medical man in practice keep abreast of modern medical knowledge? It was not merely that writers were prevented by the shortage of paper from expressing their views in book form; the shortage of journals and periodicals was also great. The editor of one of those journals advised him that he had a waiting-list of 1500 doctors seeking to become subscribers, and was quite unable to meet the demands for his journal from the liberated countries. The editor of another assured him that he could not in

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any way meet the demands of his subscribers, that his correspondents were drastically cut down, and that much medical knowledge of the first importance could not be passed on.

It was not merely the medical man in practice who needed these journals. They were essential to the medical research worker. He must have the power to express his findings as and when he pleases. He must keep in touch with the progress of his fellow workers in this country and abroad, especially in the United States. If he was denied that, some discovery of great benefit to the human race might well be delayed, or even prevented. A fellow of the Royal Society wrote that the workers with him in research did not expect to have a single paper published until 1946. How could they continue their work in such conditions? What sort of encouragement was that to give them? If the advance of medical knowledge was retarded the community as a whole was penalised. It was not merely the medical man who suffered, but the whole human race. They got a good example, perhaps in a small way, in the world of social medicine. Here was a branch of medicine which was indeed making great strides: the Goodenough Committee had urged that it should receive every encouragement. Many young and eager men and women were seeking to work in that sphere, yet at this very moment, when one would think that the Government would be anxious to encourage it, the Ministry of Supply had refused the BMA one ton of paper a year to start a journal on social medicine. These restrictions were disheartening to medical men and damaging to the public at a time when ever greater demands were being made on medicine. The number of doctors had increased by something like 12% since 1939. There were 12,000 medical students in schools—4000 more than in 1938. Even with those figures it was clear that the total demands of paper for the medical world were negligible compared with the amount in daily use. He urged the Government to do their utmost to see whether some additional grant of paper could not be made before we lost ground which could never be regained.

In his reply the Earl of SELBORNE, Minister of Economic Warfare, said that Lord Buckmaster had spoken strongly, and indeed movingly, on the shortage of medical books. He was advised that partly as a result of the efforts of the committee presided over by Sir Walter Moberly the publication of medical books at this moment amounted to 80% of what it was prior to control; but if there were the deficiencies which Lord Buckmaster described, he agreed that the matter required the most serious consideration from the authorities, and he would draw to it the attention of the President of the Board of Trade.

QUESTION TIME

Release from Military Service

Rear-Admiral BEAMISH asked the Secretary of State for War if he was aware that a district in Sussex, with a scattered population of some 3000, would be left without adequate medical attention if the sole local practitioner was again called to military service; that the recommendation in September, 1944, by the Central Medical War Committee for release had not been withdrawn by them; and would he now permit this doctor to continue his civil duties.—Sir JAMES GRIGG replied: This doctor was granted three months' release during the winter and the Central Medical War Committee have twice considered representations for an extension of this period of release, but have not seen fit to make any further recommendation to the War Office. The district is part of the borough of Brighton where there are at present relatively more doctors than in many parts of the country. In view of the very great need for doctors in the Army I regret that this one cannot be allowed to return to his civil duties.

Colonel R. S. CLARKE: Will the Minister consider whether some of the trained RAMC officers who do administrative work in field ambulances and hospitals could be exchanged for others who could do it for them, so that more doctors could be released?—Sir J. GRIGG: We try to substitute on the administrative side of the RAMC non-medical officers for medical officers as much as possible, but it cannot be done altogether. Mr. RHYS DAVIES: Will the Minister bear in mind that he may be violating the legal provisions of the National Health Insurance Act by not leaving a sufficient number of doctors in certain localities?—Sir J. GRIGG: I confess that that is one of the things which I could not answer off-hand.

Dysentery in Scotland

Mrs. A. HARDIE asked the Secretary of State for Scotland whether his attention had been drawn to the alarming increase in dysentery in Scotland.—Mr. J. WESTWOOD: There has been a sharp increase during the war in the number of persons notified as suffering from dysentery in Scotland, although the number of certified deaths is stationary since 1941. Most cases are of a mild form and involve only a few days' incapacity. The increase began long before the war, and may be partly due to improved methods of diagnosis. During 1944, there is no recorded instance of spread of the disease among the civilian population by food, milk, or water, although the possibility cannot be ruled out.

South African Military Sanatorium

Sir E. GRAHAM-LITTLE asked the Minister of Health whether, in view of the shortage of sanatorium accommodation and staff in this country, difficulties of diet and unsuitability of the British climate, and in view of the fact that there was a British military sanatorium in Johannesburg with more than 1500 beds, excluding outside convalescent institutions, he would reconsider present arrangements by which tuberculous cases which had failed to respond to treatment were automatically discharged from the services and encourage tuberculous service patients in every stage to seek treatment in South Africa.—SIR JAMES GRIGG, Secretary of State for War, replied: The majority of tuberculosis cases amongst military patients in India and the Middle East are evacuated to South Africa to the South African military hospitals and convalescent depot until cured or until they cease to become infective. This procedure is, however, restricted to those patients whose condition permits of the lengthy sea voyage involved and who are likely to respond to treatment within a reasonable time. Other military tuberculosis cases receive treatment in Army hospitals and if found unlikely to be fit for further service are discharged from the Army and become the responsibility of the Ministry of Health.

SCHOOL FOOD.—Mr. CHUTER EDE said that last October 1,250,000 public elementary school-children were having dinner in 13,150 school canteens. The number of authorities making arrangements for some children to have meals and milk during the holidays were 165 and 108 respectively.

THE MINISTRY ON HOSPITAL FOOD

THE cause of better feeding in hospitals has been well served in a new circular (44/45), to hospitals and sanatoriums, from the Ministry of Health. In it the Minister is concerned primarily with the feeding of staff, but he points out that his recommendations apply with equal if not greater force to the feeding of patients, and he is confident that he can rely on hospital authorities to study them from this point of view. The advice given is closely in line with that set out in the King Edward's Hospital Fund memorandum,[1] and our own recent series of articles on this subject.[2] The Minister considers that a separate catering department should be recognised, under the charge of a full-time officer, suitably trained, of adequate status, and directly responsible to the chief administrative officer of the hospital. In hospitals of less than 150 beds it may be necessary to combine the duties of this office with those of another, or to arrange for a full-time officer to advise a group of hospitals. The officer, who should be trained in catering and as a rule in dietetics as well (though in the larger hospitals he may have a dietitian working with him), should be responsible for the ordering, the framing of menus, the management of kitchens and dining-rooms and their staffs, the serving of meals, the transport of food to the wards, and the provision of special diets. He should work with a catering committee, specially appointed to represent the various hospital departments, and to ensure their coöperation hospital authorities are advised to review their hospital equipment with a view to bringing it up to date when times allow. The circular twice emphasises the importance of "the full drawing of rations up to entitlement." It is pointed out that the supplies available to hospitals are sufficient, and intended, to provide for occasional meals and hot drinks for non-resident staff; and that resident staff, and their visitors, should be able to get hot drinks and other light refreshments during off-duty periods.

1. Memorandum on Hospital Diet, 1943. 6*d*.; and see *Lancet*, 1943, ii, 673.
2. *Lancet*, 1945, i, 19, 61, 94, and 125.

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Letters to the Editor

OUR TUBERCULOSIS SERVICE

SIR,—The comments of "Observer" in your issue of March 3 suggest that the Joint Tuberculosis Council were remiss in omitting from their report any reference to such related aspects of tuberculosis work as social welfare, medical education, mass radiography, and industrial medicine.

In para 2 of the report, the Council specifically pointed out that a detailed plan was not practicable, and accordingly the report dealt with fundamentals instead of attempting a complete blue-print. The report emphasises, in particular, the fact that a satisfactory service can only be built up in areas which are sufficiently large to undertake comprehensive schemes and to employ first-class clinicians and other personnel. Given these foundations, one could look forward to an efficient service if certain other requirements were met. These would include proper coördination with local sanitary authorities, with local health services generally, with voluntary hospitals and, within the service itself, with sanatoria and dispensaries. On such a basis, but not otherwise, the superstructure envisaged by "Observer" could be erected.

The Joint Tuberculosis Council, however, are for the present much more concerned with principles than with refinements. Social welfare workers, almoners, and mass radiography are all relative fledglings in the tuberculosis world, and it is a little early for the Council to offer guidance on these matters. Medical education and industrial rehabilitation are mentioned in the Council's report, but here again, the emphasis is on principle rather than detail.

For my own part, I believe that if the recommendations in the report could be implemented, the Council would gladly turn its attention to the subjects mentioned by "Observer." But it seems to me that while the foundations of tuberculosis work are still insecure, to fix attention on particular aspects would tend to obscure the main problem.

Oxford. N. J. ENGLAND.

SIR,—Dr. Fuller's letter (March 10) raises one of the major issues involved in the reorganisation of the tuberculosis service. The present position as regards the diagnosis of chest disease in general is that an increasing number of patients are being referred to tuberculosis dispensaries. The reasons are quite clear. Improvements in diagnostic facilities in these clinics—above all the provision of X rays—have established in some areas a unit which is convenient of access both for patient and general practitioner. Tuberculosis is always in mind in a case presenting pulmonary symptoms requiring special investigation; hence the increasing use of local clinics where they have been set up on an efficient basis. The result is that the tuberculosis officer, in an increasing degree, is having to deal with clinical material which falls naturally within the wider specialty of chest medicine, and is severely handicapped in his work because of the persisting separation of the tuberculosis service from medicine as a whole.

As a solution to the problem, Dr. Fuller suggests that diseases of the chest, including tuberculosis, be dealt with in special hospital departments under the direction of a clinical specialist. The tuberculosis officer—one of the assistant staff—would undertake some part of the out-patient work. The advantages of incorporating the tuberculosis service in the new hospital scheme have been widely agreed, and have been stressed in more than one recent report on the subject; but it is questionable whether the method suggested by Dr. Fuller would best meet the position.

If a truly efficient service is to be provided, it is of the first importance that all aspects of the problem be dealt with in practice by an organisation within which a proper coördination can be achieved. The clinical part of the work, the social problems, rehabilitation, and prevention, are inextricably bound together, and should be regarded as the responsibility of a single department under an experienced physician. Hospital beds for diagnosis and some aspects of treatment are required, and assistant medical, nursing, and almoner staff must be adequate. Coöperation with sanatoria serving the area, and with other hospital departments, both medical and surgical, is essential. To place the tuberculosis unit as a whole under the control of the medical director of a special chest department, whose interests would be primarily clinical, would not, however, guarantee that wide experience and understanding of the whole subject so essential in medical staff dealing with it. There will also be certain practical difficulties; special pulmonary units will probably be able to serve an area which has to be subdivided for tuberculosis work, and one physician would scarcely be able to supervise the whole territory.

The deficiencies of the present scheme are to be found in the lack of facilities of all kinds and poor staffing in some areas. To attempt to improve the position by recreating the tuberculosis clinic as a subsection of a department of chest medicine might, however, easily result in the special features of the tuberculosis problem being lost sight of. Also, the limited responsibility and scope of work of the tuberculosis officer would not encourage that improvement in staffing which is desired. It seems preferable to aim at the highest efficiency in a tuberculosis service which is an entity in itself, though it would certainly gain much by being incorporated in the new hospital service. It would there be in touch with general medicine, and yet retain its responsibility for dealing with all aspects of the disease, both as it affects the individual and as it constitutes a major problem of the public health.

Redhill Chest Clinic, Edgware. HUGH RAMSAY. A. STEPHEN HALL.

A FACULTY OF OPHTHALMOLOGISTS

SIR,—In his reply on Feb. 17 to my letter of Feb. 10, Mr. McMullen accuses me of many inaccuracies, and is obviously concerned to indicate, to those unfamiliar with these matters, that the Council of British Ophthalmologists has been representative of a large number of ophthalmic surgeons, and has even taken an active part in ophthalmo-political affairs.

The meeting to which ophthalmologists are invited each year to "receive and discuss" the annual report of the CBO takes place after the clinical meeting of the Ophthalmological Society of the United Kingdom, and those who attend have no voting powers. I have rarely known it to attract much more than a score of interested eye men, most of whom have seemed to belong to the some 25–30 actual members of the CBO. The meeting lasts about half an hour, most of which is occupied by the reports of the secretary and treasurer. The fact that a meeting does take place each year, however, is indeed fortunate, as without it one must assume that Mr. McMullen would have been unable to refute in so devastating a fashion my charge that the CBO has had a purely nominal existence among the mass of ophthalmologists.

Mr. McMullen has found it necessary to go back nearly twenty years to find the few occasions which he cites against my assertion that the CBO has taken no active part in ophthalmo-political matters for well over a generation. Significantly, these isolated excursions into the field they now seem to wish to dominate are undated, so I cannot return the charge of inaccuracy. I can, however, give 1927 as the date on which the CBO officially disclaimed all interest in ophthalmo-political matters by its president's statement at the annual general meeting that "his council was not interested in the problem of fees paid to ophthalmologists"—an attitude it has maintained ever since.

Mr. McMullen has offered no facts opposing the general tenor of my letter, which was an indictment of the Faculty based on the following points:

(*a*) That the use of the academic title of "faculty" for a body designed to subserve an essentially ophthalmo-political function is unwarranted, particularly under the controversial circumstances of its formation and constitution, and in the absence of fellows.

(*b*) That it is not democratically constituted.

(*c*) That it is an attempt to designate categories of ophthalmologists in an arbitrary fashion which is not based upon the interests of ophthalmologists as a group or the public they serve.

(*d*) That no body of ophthalmologists could accept the proposal of the CBO minute 5, 1944, and now one presumes

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embodied in the constitution of the Faculty—viz: "that decisions or recommendations of any mass meeting of members or associates should be considered by the Council but should not necessarily be acted upon or implemented." (This detail has been omitted from the *published* announcements.)

Mr. McMullen's concluding paragraph completely confirms the substance of my charge that the Faculty is a manoeuvre to enable a small, unrepresentative body of ophthalmologists to determine the future course of ophthalmologists on criteria satisfactory to itself, but unhesitatingly repudiated by the Association of British Ophthalmologists—the only large organised group of ophthalmic consultants—which represents half the ophthalmic profession.

London, W1. LIONEL M. GREEN.

A CHAIR OF PSYCHIATRY

SIR,—The proposal to establish a university chair of psychiatry in London University, mentioned in your issue of Feb. 17, raises once again the question of the principle which should govern the making of medical appointments during the war. Many medical officers serving in India and in Burma believe that appointments at home will be filled by candidates on the spot; and will be filled before general hostilities cease, or on the cessation of hostilities in Europe. In this they may or may not be correct. No authoritative statement has been made on the matter. Under the circumstances they are bound to regard their professional future with considerable anxiety. They feel that their chances of success in obtaining appointments are less favourable than those of medical men at home who are able to advance them personally. They are, in addition, disquieted by a sense of remoteness, a general lack of information and the delay in getting it, and especially by the knowledge that some appointments may be filled for which time does not permit their candidature.

This matter, and others arising from it, have been discussed at some length by the Consultants in India Command, and they advocate (*a*) that all appointments to the staff of a hospital, university, public institution, or other body, should be temporary until the close of hostilities or until demobilisation is well advanced, and (*b*) that medical officers, serving overseas, should be given ample opportunity to apply for appointments. The difficulties in the rigid application of these proposals, in every instance, are understood and appreciated. Medical reconstruction and other programmes may require that certain appointments be made permanent in order to avoid a break in direction. But such conditions are rare.

The letters of Service Psychiatrist and of Brigadier James are timely; and I desire to associate myself with the opinions contained in them.

E. A. BENNET,
Consulting Psychiatrist, India Command.

SIR,—The impending appointment to the University of London chair of psychiatry is a matter of remote practical consequence to the majority of doctors serving overseas. Why make such a song and dance about nothing? Most of these men are destined to return to civil life as general practitioners, in whose sphere public appointments as a general rule find no place. It is these fellows with no secure jobs to return to, who are most in need of a square deal when the war ends.

Northampton. R. W. MAXWELL.

RESTAURANT HYGIENE

SIR,—I quite agree with Lord Amulree (March 10) that bacteriological investigation should be used to confirm clinical findings. The object of my letter was to show that organisms known to be pathogenic may exist in cracks and chips of crockery. I do not agree that a small number of organisms would necessarily be less dangerous than a large number. A reduction of the number would merely lengthen the period of incubation. Personally I should be just as reluctant to imbibe 2 typhoid bacilli as I should be to imbibe 2000. It may perhaps be true that a small infection of staphylococci is less dangerous than a large infection, but this depends on the individual's condition of health and resistance. My argument is merely that a crack in a cup can hold a pathogenic organism after the cup is used by an infective person, and from there the organism may be transferred to a healthy person. In other words, avoid cups with storage depots of germs; you will be given no guarantee that such a cup has not previously been used by a diphtheria or typhoid carrier.

There is no evidence that disease is spread by this means, because the authorities have not taken the trouble to investigate. I hope Lord Amulree has done so.

London, W1. SYDNEY LINFOOT.

INFECTIOUS DISEASES IN FRANCE

SIR,—Your special correspondent in his article on France Today (March 3) says he was informed that there had been no increase in infectious diseases among children during the war years. Perhaps he was referring to the figures of admission to a particular hospital; for I hardly think the statement is true of the country as a whole. For example the *Weekly Epidemiological Record*, issued by the League of Nations secretariat (RH 970, September, 1944) gives the following figures as for cases of diphtheria notified in France:

1928–38 (av.) ..	19,839	1940 ..	13,568	1942 ..	31,466
1939 ..	14,019	1941 ..	20,018	1943 ..	46,539

In terms of rates per 100,000, the figures "jumped from 35·9 in 1939 to 118·7 in 1943" (*Lancet*, 1944, ii, 628).

Camberley. M. BEDDOW BAYLY.

*** Our Special Correspondent writes: I should have made it clear that Professor Debré was speaking only of the Paris region, and of 1944 as compared with previous years. Thus the League statistics neither refute nor confirm his opinion. I may add that all figures collected in Europe during the German occupation should be accepted only with reserve, whoever may have collected them.—ED. L.

REABLE OR REHABILITATE?

SIR,—For some year or two I have suggested to friends who write and teach that we should say "reable" instead of "rehabilitate." It therefore gives me pleasure, though I stake no claim, to read of "reabling" and "reablement" in your last three issues.

The word "able" was formerly used as a verb, meaning to make strong or to enable (Shorter OED) or to make able (Webster). The OED quotes "I'll able 'em" (*King Lear*) and "If God shall me able" (Evelyn). It is still so used, with the negative prefix, in the verb "disable," and in "disabling, disabled, disablement."

"Rehabilitation" is a dictionary word of respectable age, but it maintains the reputation we doctors have of using long words, and in its relation to medicine might with dignity retire. Your powerful example will favour the simpler terms reable, reabling, reabled, reablement.

Ruthin, North Wales. EDMUND SPRIGGS.

ARTIFICIAL RESPIRATION

SIR,—Artificial respiration by rib traction (Schüller's method) has been known and practised for a long time. This method is described in Chalmers Watson's *Encyclopædia Medica*, vol. I, published in 1899. It is particularly recommended for use in cases of narcotic poisoning as being less fatiguing for the operator where artificial respiration may have to be kept up for a lengthy period.

Heavitree, Exeter. MALCOLM HAY.

THE COMPLETE LEAD-SWINGER

SIR,—Your peripatetic correspondent of March 10 may be interested to learn that the German propaganda leaflet he describes is a copy in many respects of one surreptitiously introduced among German troops, disguised as a miniature treatise on ballistics, an account of which is given by Monsieur Vulliet, under the heading of "Le manuel du parfait simulateur militaire," in *Revue Médicale de la Suisse Romande*, 1944, **64**, 55.

The Library, Royal Society of Medicine. J. D. KELSON.

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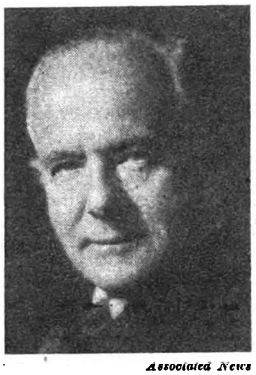
Obituary

HAROLD CHAPPLE

M CHIR CAMB., F R C S

Mr. Harold Chapple, senior obstetric surgeon to Guy's Hospital, died on March 8 at the age of 63. Though he was due to retire at the age of 60, and had had a coronary thrombosis in 1938, he chose to keep on with his work at Guy's to help the short-handed medical school. His regular visits to the country branches of the hospital must have been an extra strain on his health.



Associated News

He was an Australian by birth, the son of Frederic Chapple, CMG, headmaster of Prince Alfred College, Adelaide, and was educated there and at Adelaide University, where he took his BSc, before going to Cambridge. He got a half-blue for tennis at Cambridge, and showed himself a keen rugby footballer and swimmer, and an able actor. He went to Guy's in 1905, and qualified MB in 1908. After the usual house-appointments, he took his FRCS in 1910 and his M Chir in 1911, and then for a short time was assistant in the obstetric department of the Charité Krankenhaus, Berlin, returning as obstetric registrar to Guy's. He was an enthusiastic disciple of Sir Arbuthnot Lane, whose daughter, Irene, he married in 1911, and published several articles about that time on intestinal stasis and the effects of short-circuiting or excising the colon. When James Targett died, in 1913, Chapple succeeded him as obstetric surgeon at Guy's. He served as a captain in the RAMC throughout the war.

Chapple was an essentially practical gynæcologist, keenly alive to the problems of disease considered as a personal misfortune. He took pains to familiarise himself with details of the patient's home and marital conditions, and gave due weight to emotional as well as environmental factors in planning treatment. He would never allow the search for knowledge to intrude so far into clinical work as to become a menace to the individual patient. To him the supreme test of any form of treatment was the benefit it was likely to bestow on the particular patient in her particular circumstances; if it helped her it was good; if it failed to help her it found no place in his practice. His students thus learnt not only the principles of the specialty he taught but something more fundamental which influenced their whole outlook in later life. He was quick to sum up the character of patient or assistant but could withstand verbosity or ineptitude with unruffled patience. Even though he appreciated to the full how much was at stake for the patient during an operation his habitual calm in the theatre never failed him. He was an excellent host, cheerful and friendly, with a fund of good stories, and he made an admirable president of the Medical Golfing Society during the last five years of his life. Every Guy's man who qualified during the 30 years he was on the staff will remember his sound common-sense teaching in the lecture-theatre, outpatients, or wards.

He leaves a widow and two sons.

THE LATE LORD DAWSON

"S. R. A." writes: Over forty years ago I was attending Dawson's therapeutics class at the London Hospital; and I remember the same choice of the appropriate word, the same force and clearness in his sayings, as were evident later in more responsible and public utterances. As a young man he already showed his charm of manner and his primary thought for the patient's good.

We, later his clinical clerks, recall his demonstrations of how eyes, ears, and fingers must be instruments in investigation; we ought never to have failed to benefit from a single ward round. Later, as his house-physician, it fell to my lot to collect cases for demonstration one day a week. Whether he was talking about one case or a series, his enthusiasm was unbounded, and the large crowd of listeners were well rewarded for their regular attendance. A second day in the week he would take only his clerks round the ward, and by his example prove the value of careful examination and kindly treatment. His hospital patients were treated exactly like his private patients, with human understanding. Apart from routine visits he was always willing to come for a bad case. I remember one desperately ill probationer whom he saw daily for some twelve days, even if it meant coming at six in the morning to fit in with other duties. His never-failing courtesy, consideration and kindness to his senior, to his juniors, to sisters and nursing staff, to patients and porters, were a lesson and example to all his team, without any diminution of our admiration for his unique professional ability. He was before his time in his keenness for physical education, and for the development of social medicine, but he also did more than his share in the way of training students in professional knowledge and for the problems of the future.

Before the 1914 war I became a hospital colleague at the London, and I would pay tribute to his chairmanship of the medical staff. He was kept in the chair for many more years than was any other holder. His enthusiasm for meetings and his personal labours in preparation were immense. Early on came all those discussions on medical education for the sittings of a Royal Commission, and his guidance and powers of appropriate phraseology were unique assets in producing the final report. These efforts took it out of him, but a good long summer holiday in the North restored him by October at first; though as the years went by, and powers of recuperation become a bit slower, the return from the summer holiday had to be fixed later. He served the hospital well and faithfully, so that it shared in his reputation and the honours conferred upon him. When his time came to an end, it was the unanimous wish of the medical staff and the lay committee that he should not be allowed to descend to the well-earned rest of the consulting staff, and he remained for another five or six years as extra physician. It was a unique testimonial to a colleague.

A severe test for any medical man is to be laid personally on a bed of sickness. Dawson was not keen on pure athletics as a student, but he was keen on physical education, and he was unusually muscular and fit physically. All the same he had his bouts of confinement to bed, and he made an ideal patient with no questionings and no impatience. He passed this test with flying colours.

As a student of over forty years ago, one can recall how his handsome appearance and bearing appealed to the imagination. In addition his wedding appealed to the romantic element in our nature; and Lady Dawson became a great friend to students and to all the hospital activities. One knows how these two English people helped at times those who had fallen by the wayside. We lose a hero, a very wise physician, a friend, and a counsellor.

LORD MORAN'S TRIBUTE

The following personal appreciation by the president of the Royal College of Physicians appeared in the *Sunday Times* of March 11 and is reproduced by courtesy of the Editor:

It will be a long time before any member of the medical profession will again influence opinion in England as Lord Dawson did between the two wars.

I am not sure that I can explain this to those who did not know him. He stood apart from others not so much for his pre-eminence as a physician, but rather because he possessed a gift which is more prized than any other by men of affairs: he knew instinctively what the average man was thinking and how he would react to some measure or action that had been taken by the official world. He was, of course, born with that gift, but he had developed and perfected it over the years until his judgment in such matters was impressive.

This almost intuitive knowledge of what was happening in men's minds contributed to his success in practice—and no doctor in his time was more successful. Once when I had seen a patient with him and we had to explain

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to half a dozen relatives the gravity of the complaint, he appeared to divine at once what was passing through their minds, and he was able to quieten their fears in turn before they had even found expression.

Like his Royal patient, King Edward VII, Lord Dawson was more interested in men than in books. He learned from experience, so that he had come to have a profound knowledge of the ways of men. His name was a household word for two generations; all the prizes that the world can give were his. Great professional success makes day of night, but he never hurried over anything, and he gave as much care to the humblest commoner as to the King of England.

He was quite unspoiled by success, and never lost his curiosity in young people. He spoke to them as one of themselves, and they opened their hearts to him. Lord Dawson himself seemed until quite lately to be untouched by time. His eager spirit continued to regard life as great fun; it was still an adventure that had not lost its freshness. In mind and body he remained alert; even in going upstairs he would take two steps at a time.

Then came distressing illness. He wrote to me after his first operation: "So far so good, but not very far." And after the second and more serious operation he remained undefeated. He insisted on being kept in touch with affairs, and one of those summoned to his bedside has told me that it was an hour and a half before he was allowed to depart. He had enjoyed a strenuous life, and now he was resolved to go on working to the end.

MEMORIAL SERVICE

A great body of Lord Dawson's friends and colleagues, and representatives of the many institutions with which he was associated, attended a memorial service in Westminster Abbey at midday last Tuesday. The Dean of Westminster (Bishop Labilliere) officiated.

On Active Service

CASUALTIES

DIED

Captain BERNARD ALFRED MACLEAN BROWN, MC, BM, RAMC

WOUNDED

Captain W. J. CAMERON, RAMC
Captain A. L. STALKER, MB ABERD., RAMC

AWARDS

MBE

Captain J. H. D. MILLAR, MD EDIN., RAMC

Flight-Lieutenant R. C. DICKSON, MB EDIN, RAFVR

One afternoon in November, 1944, an aircraft landed from an operational sortie but when it had proceeded some 600 yd up the runway, an explosion occurred and the aircraft burst into flames. Flight-Lieutenant Dickson, the medical officer of the unit, immediately hastened to the scene and, on arrival, found one member of the crew lying clear of the wreckage. After giving this airman a cursory examination, Dickson gave instructions for him to be removed to hospital immediately. By this time ammunition and pyrotechnics in the aircraft were exploding continuously. The petrol tanks were blazing furiously and liable to explode at any moment. Undeterred, Dickson went to the aircraft to help another member of the crew who was trapped in the burning geodetics, his boots being on fire. Displaying complete disregard for his own safety, he tore away the geodetics with his bare hands, injuring himself in the process, and freed the airman whom he then dragged to safety. Flight-Lieutenant Dickson's courage and devotion to duty on this occasion undoubtedly saved two lives. He has at all times shown outstanding devotion to duty and has done much to maintain the morale of air crews and ground personnel during difficult periods.

MEMOIR

Flight Lieutenant E. A. WALLIS was born in 1912, and studied medicine at the Royal Colleges, Edinburgh, qualifying in 1940. After a hospital appointment at the Eastern General Hospital, Edinburgh, he was commissioned as flying-officer in the medical branch of the RAF Volunteer Reserve in 1941. At the time of his death he was serving as medical officer to a squadron overseas.

Colonel K. S. MASTER, MC, IMS, has been appointed honorary physician to the King in place of Colonel A. C. Macrae, IMS, who has retired, and Colonel W. C. SPACKMAN, FRCOG, IMS, honorary surgeon in place of Major-General R. H. Candy, IMS, who has retired.

Notes and News

STAINING OF TISSUES

IN 1714 Leeuwenhoek, in a letter to the Royal Society, described the staining of cow muscle with saffron macerated in wine. He hoped to distinguish the muscles of a fat and a lean cow; instead, he discovered the value of colouring agents in microbiology. Reichel (1758) and an Englishman John Hill (1770) added a little to early knowledge, but it was not until 1848, when Quekett mentioned the use of fustic and logwood in making tissues less transparent, that interest in non-vital dyeing revived. Two botanists, Goeppert and Cohn, described the value of carmine in 1849, and two years later Corti made the fundamental observation that the nuclei of the epithelial lining of the cochlea could also be stained with carmine. Dyeing as a standard technique in animal histology was introduced by Gerlach in 1858.

The injection of coloured substances into blood-vessels was a much earlier discovery. Eustachi (1524–74), Malpighi (1628–94), and others used the method to help naked-eye observations; but Ruysch (1725) employed the microscope to examine specimens which he injected with tallow and wax coloured with cinnabar. Vital colouring of pre-existent structures was discovered by Trembley (1744), who made members of the genus hydra flame-coloured by feeding them with the integument of hydrachnids, or a delicate green by a helping of rose aphids from which the legs had been removed to make them easier to swallow. Von Gleichen (1778) produced colouring by phagocytosis when he fed infusoria with carmine-coloured water mixed with an infusion of wheat. The application of this method to the cells of metazoa was first made by Ranvier (1875) who injected suspensions of aniline-blue and vermilion into the dorsal lymph-sac of frogs and subsequently found the coloured particles within the cytoplasm of lymphocytes.

The value of colour reactions in revealing chemical composition was demonstrated by Link (1807), and the discovery of the blue reaction of iodine with starch belongs to Colin and de Claubry in 1814. But the real founder of histochemistry was François Vincent Raspail who described in 1825 the results of the application of chemical processes to specimens examined under the microscope. Among his achievements are the discovery of the xanthoproteic reaction, Liebermann's test, and the aldehyde test for proteins, and the invention of the frozen-section technique, and micro-incineration. Trying to publish some of this remarkable work, Raspail sought the advice of a physiologist, a chemist, and a botanist. Unfortunately the first was ignorant of chemical reactions, the second of microscopy, and the third of both; but the book was published in 1830. Baker's[1] logical and lively essay on these important scientific events should interest all biologists as well as historians.

Royal College of Surgeons of England

The King, who is Visitor of the College, has made a donation to its restoration and development fund.

At a meeting of the council held on March 8, with Sir Alfred Webb-Johnson, the president, in the chair, it was decided to extend admissibility to the fellowship examinations to holders of any medical qualification registrable on the British Medical Register.

Sir Arthur MacNalty was appointed Thomas Vicary lecturer for 1945; Prof. W. E. Gye, FRS, and Dr. L. Foulds were appointed Imperial Cancer Research Fund lecturers in the College for 1945.

Diplomas of membership were granted to J. A. Litchfield and R. E. Moore. The following diplomas were granted jointly with the Royal College of Physicians:

DOMS—P. L. Allen, Jacob Berkson, E. A. Butterworth, J. S. Crawford, G. P. Crookes, Abraham Dala, W. M. C. Gilmour, H. L. Gulati, J. R. C. Holmes, G. A. D. Lamb, R. L. Parish, J. M. Posada, S. P. Redmond, and Jane P. Smith.

DMR—Matthew Bennett, V. J. Coffey, J. C. Dore, E. W. Hyde, Katie H. Jones, K. M. N. McMahon, Berthold Mannheimer, S. L. Mitra, A. D. O'Connor, D. P. O'Sullivan, T. R. Riley, Karol Sicher, W. G. Smith, and R. E. Steiner.

Auxiliary Royal Army Medical Corps Funds

The annual general meeting of the funds will be held at 11, Chandos Street, London, W1, on Monday, April 9, at 6 PM.

1. The Discovery of the Uses of Colouring Agents in Biological Micro-technique. (Monograph of the Quekett Microscopical Clubs.) J. R. Baker, DSC. London: Williams and Norgate. Pp. 22. 1s. 6d.

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Queen Mary's Hospital, Roehampton

The Ministry of Pensions has arranged for a free bus service for disabled patients and their escorts between the hospital and Barnes station-bridge.

Royal Eye Hospital

At a meeting of the clinical society to be held at the hospital St. George's Circus, Southwark, SE1, on Friday, April 27, at 5 PM, Mr. T. E. Cawthorne will speak on nystagmus.

Royal Society of Medicine

The house and library of the society will be closed from Good Friday, March 30, to Easter Monday, April 2.

At the section of odontology on Monday, March 26, at 4.30 PM, Captain Sognnaes will speak on four months in Tristan da Cunha, and Prof. Sheldon Friel on migrations of teeth following extractions.

Association of Industrial Medical Officers

The Scottish group of the association will meet on Wednesday, March 28, at 2.30 PM, in the orthopædic department of the Western Infirmary, Glasgow. Prof. C. W. Illingworth will speak on the peptic ulcer, with special reference to factory conditions, and Mr. Roland Barnes on treatment of the painful shoulder, and the problem of resettling in industry.

Middlesex County Medical Society

At 5.30 PM, on Tuesday, March 27, at West Middlesex County Hospital, Isleworth, Sir Joseph Barcroft, FRS, will read a paper on movements of the human fœtus, which will be illustrated by a film produced by Dr. M. M. Deane, Miss Irene Titcomb, BM, and members of the obstetric staff. At 6.15 PM, Mr. Frank Law will speak on ophthalmoscopy in general medicine.

Register of Physiotherapists

The Chartered Society of Physiotherapy (formerly called the Chartered Society of Massage and Medical Gymnastics) has resigned its membership of the Board of Registration of Medical Auxiliaries as from Jan. 1, 1945, and the society's own directory will now be the only complete record available concerning chartered physiotherapists.

Refresher Courses for American Medical Officers

Medical officers of the United States Army who for a year or more have been engaged in administrative and other non-professional work and who are to be assigned to professional duties will be given an opportunity of taking refresher training at general and regional hospitals for a period of not more than 12 weeks.

Consultant Appointments for LCC Officers

Dr. A. J. Lewis, clinical director at Mill Hill Hospital, has been appointed civilian consultant in psychiatry to the Royal Air Force. Dr. Eliot Slater, clinical director at Sutton Emergency Hospital, is to succeed Dr. Lewis as consultant in medical psychology at the British Post-Graduate Medical School.

Paddington Medical Society

On Tuesday, March 27, at 9 PM, in the board room of St. Mary's Hospital, London, W2, Mr. F. A. Juler will deliver a lecture on modern remedial measures in ophthalmology.

Board of Control

Dr. W. S. Maclay, superintendent of Mill Hill Emergency Hospital, has been appointed a senior medical commissioner of the Board.

Dr. Maclay, who is a son of the first Baron Maclay, received his medical education at Cambridge and St. Bartholomew's Hospital, qualifying in 1927. He spent 3 years as medical officer in native hospitals in Kenya, and after holding appointments at the Royal Chest Hospital, and Great Ormond Street, he returned to Bart's as chief assistant in the department of psychological medicine. He obtained his MD Camb. in 1934 and took his DPM the following year. He is physician to outpatients at the Maudsley Hospital and is also on the staff of the West London Hospital and the King George Hospital, Ilford. Since the war he has been in charge of the EMS neurosis centre at Mill Hill, and in 1943 at the request of the Ministry of Health he visited the United States and Canada, lecturing and showing a film of the pioneer work done at the hospital. He was appointed OBE in 1943. Dr. Maclay's published work includes papers on the effects of mescalin and on schizophrenic drawings.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED MARCH 10

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1424; whooping-cough, 1502; diphtheria, 472; paratyphoid, 5; typhoid, 5; measles (excluding rubella), 25,049; pneumonia (primary or influenzal), 813; puerperal pyrexia, 144; cerebrospinal fever, 77; poliomyelitis, 7; polio-encephalitis, 0; encephalitis lethargica, 5; dysentery, 412; ophthalmia neonatorum, 47. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on March 7 was 1225. During the previous week the following cases were admitted: scarlet fever, 23; diphtheria, 17; measles, 165; whooping-cough, 26.

Deaths.—In 126 great towns there were no deaths from scarlet fever, 1 (0) from an enteric fever, 24 (0) from measles, 3 (1) from whooping-cough, 6 (0) from diphtheria, 52 (6) from diarrhœa and enteritis under two years, and 39 (5) from influenza. The figures in parentheses are those for London itself.

Leeds reported 4 deaths from measles. There were 10 fatal cases of diarrhœa at Birmingham.

The number of stillbirths notified during the week was 171 (corresponding to a rate of 25 per thousand total births), including 20 in London.

Births, Marriages, and Deaths

BIRTHS

BROUGH.—On March 7, the wife of Dr. Maurice Brough, of Rushden, Northamptonshire—a son.

CORCORAN.—On March 12, at Bognor Regis, the wife of Major T. M. Corcoran, RAMC—a son.

GARAI.—On March 14, in London, the wife of Dr. Oliver Garai—a son.

HOLMES.—On March 13, at Grantham, the wife of Dr. J. C. S. Holmes—a son.

WEDDERSPOON.—On March 11, at Newcastle-on-Tyne, the wife of Surgeon Lieutenant J. M. Wedderspoon, RNVR—a daughter.

MARRIAGES

BRUCE—HERDMAN.—On March 14, in Edinburgh, J. Alastair Bruce, FRCPE, lieut.-colonel RAMC, to Nan Herdman, junior commander, ATS.

ELLIOTT-BLAKE—SWAYTHLING.—On March 17, in London, Henry Elliott-Blake, FRCS, to Lady Swaythling.

FELTON—HERVEY.—On March 17, at Great Billington, Beds, William Fowler Felton, major RAMC, to Felicity Anne Hamilton Hervey.

KINGDON—BRETT.—On March 14, at Sedlescombe, Ernest Cory Kingdon, MB, to Lilian May Brett.

LUCY—BLOXHAM.—On March 12, in London, Henry William Lucy, OBE, lieut.-colonel RA, to Betty Cecil Bloxham, MB.

RUBIN—GILROY.—On March 14, at Tiverton, Jack Rubin, FRCSE, to Margaret Joanne Gilroy.

TAYLOR—MADEW.—On March 10, at Worthing, Harry C. C. Taylor, MD, to Margery Madew.

DEATHS

BELT.—On March 7, Thomas Henry Belt, MD TORONTO, aged 43.

BETTS.—On March 9, at Crowborough, William Andrew Betts CMG, MD EDIN. & CAPE TOWN, FRCSE, aged 78.

EDWARDS.—On March 10, at Devoran, Philip Hugh Edwards, MRCS, aged 75.

EYRES.—On March 12, at Swale, Keswick, Hugh Middleton Eyres, MB EDIN., formerly of Richmond, Yorks.

LEWIS.—On March 17, at Rickmansworth, Sir Thomas Lewis, CBE, MD. LOND., LLD BIRM & WALES, FRCP, FRS, aged 63.

MUMMERY.—On March 13, Stanley Parkes Mummery, MRCS, LDS, of Harley Street, London, W1.

SEYMOUR.—On March 11, at Rottingdean, Sussex, Harold Farley Seymour, MD LOND., FRCS, FRCOG, formerly of Hove.

ROSE-HIP SYRUP FOR POLISH CHILDREN IN FRANCE.—Local wine merchants in the Verdun area have lately been bottling 1000 gallons of rose-hip syrup, flown from this country in casks, for distribution among a large number of Polish children suffering from malnutrition. These children had been deported to France by the Nazis to help with the root crops, and our advancing armies found them in a concentration camp badly underfed and showing serious signs of vitamin deficiency. In response to an appeal, the Ministry of Supply found that 1000 gallons of rose-hip syrup, rich in vitamin C, could be spared from the stocks now on sale in chemists' shops for children and adults. The hips had been gathered by voluntary collectors—mostly schoolchildren, Boy Scouts, and Girl Guides. The whole amount has now been bottled and distributed.

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RESETTLEMENT OF THE DISABLED IN WORK

THOMAS FERGUSON
M D, D SC EDIN., F R C P E, D P H, F R S E
PROFESSOR OF PUBLIC HEALTH IN THE UNIVERSITY OF GLASGOW

IN different countries the approach to settlement and resettlement of the disabled in suitable work has followed different lines.

In Denmark, for instance, where since 1927 the Invalidity Insurance Court has administered a statutory scheme designed to prevent or mitigate "invalidity" (reduction to one-third or less of normal earning capacity by virtue of disability), the approach has been predominantly medical. There is a system of compulsory notification to the State by doctors and the heads of hospitals and schools of all "invalids" or potential "invalids," and they are given thorough medical or surgical care: some 6·5% of the cases notified receive vocational training and a further 2% are helped to obtain machines for work at home.

In the United States, on the other hand, where it has been estimated by the public health service that as many as 8 million men, and almost as many women, of working age have some handicap that would hinder them in obtaining employment, and that approximately 1 million men of the 8 million require rehabilitation before they can be employed in an occupation commensurate with their education or ability, the approach has been essentially along the lines of vocational placement with extensive "job analyses" designed to ascertain what jobs are compatible with particular disabilities. Less has been done towards medical or surgical rehabilitation.

In the autumn of 1941 the British Ministry of Labour introduced its interim scheme for the resettlement of the disabled. This aimed primarily at the augmentation of labour for war industries, and its resources were available to men and women disabled from whatever cause—whether invalided out of the Services, rejected for military service, or referred by civilian doctors or hospitals. It was designed to find for the disabled work compatible with residual disability, and it undoubtedly represented a considerable forward step. More recently the passing of the Disabled Persons (Employment) Act has opened a new chapter in the care of the disabled, contemplating as it does their registration and resettlement, with a statutory obligation on industry to employ a quota of disabled persons.

EMPLOYMENT AFTER INVALIDING

In 1942 a study was made of the health and working experience of 1000 consecutive persons of Scottish domicile boarded out of the Forces as unfit for further service.[1] This investigation was based on the framework of the interim scheme of the Ministry of Labour and National Service; where necessary the records were amplified by consultation with hospitals and with family doctors. Efforts were made to secure suitable work for the men and in some cases hospital treatment was arranged. All were followed up during the third month after discharge, and when necessary they were helped. They were followed up again six months after leaving the Services, and data were collected about their medical, social, and employment experience since their return to civil life. By the end of the six months 4 of the men had died, and for various reasons it was impossible to obtain detailed information about 21 others; but full records were available for 975, two-thirds of whom were under 35 years of age. The principal causes of invalidity were, in order, psychoneurosis, peptic ulcer, and injuries. Duration of service with the Forces ranged from a few weeks upwards, and was less than 3 years in some five-sixths of the cases.

During the six months following discharge, 65% received care from their own doctors and 16% hospital treatment for the condition for which they were discharged from the Services. At the end of that period 16·5% were unemployed, 40% had gone back to their old work, 39% had taken up new work without training, and 4·5% new work with training under the interim scheme: 26% returned to the service of their old employer, some to do lighter work. Altogether, 26% of the men made false starts at work at which they were unable to continue. Of those who were known to return to work, the majority did so within a month, and over 90% within three months of leaving the Forces. At the end of six months, 37% of the men reported difficulties of varying kinds, and it was found necessary in 19% of cases to take exception to the nature of the work done by the men in view of their disabilities, or in some cases their failure to obtain medical treatment urgently required.

While these results leave much to be desired, they are considerably better than those obtained in a series broadly comparable immediately before the introduction of the interim scheme: the percentage unemployed six months after leaving the Forces in that series was 27.

A SAMPLE OF CHRONIC INCAPACITY

The extent and causes of long-continued incapacity for work among the civilian insured population are known. In Scotland during the year ending June 30, 1938, the total volume of sickness incapacity was 14·08 days per insured person, and incapacity which continued throughout the whole of the statistical year represented 43·8% of the total recorded incapacity—an increasing figure. The principal causes of the "chronic" incapacity were, in order, mental and organic nervous diseases, diseases of the circulation, respiratory diseases, rheumatic conditions, neurasthenia and debilities, diseases of the digestive system, and tuberculosis. Many of these patients were long past any prospect of restoration to fitness for work, but an investigation before the war under the auspices of the Department of Health for Scotland indicated that there was considerable prospect of arresting the drift into chronic incapacity, though this would sometimes require change of employment.

APPLICANTS FOR TRAINING IN NEW WORK

To obtain further information about the type of patient with residual disability presenting employment problems at the present time—when the circumstances of war are likely to upset the clinical distribution of disability, the availability of work, and the nature of that work—and an estimate of the difficulties of disabled men, it was decided to follow up the experience of a series of men who had applied in 1942–43 for training under the interim scheme. The cases applying for training represent a mere fraction of the cases in which guidance on work (and often change of work) is necessary because of residual disability; they probably include more than a fair share presenting special employment difficulty as well as a leaven of men who, being ambitious, are anxious to have training to open new doors.

In this series it was found that 40% of the applicants for training had been disabled in the present war, and 10% in the last war; 9% were industrial casualties, and in the remainder disability had its origin in accident or illness arising in ordinary civil life; 61% were under 35. Some of the men have been idle, or at work only intermittently, for many years. In 34% of cases disability was the result of injury; about half of these patients had had amputations, usually involving the leg. Most of the others suffered from "medical" conditions—chiefly peptic ulcer, tuberculosis, respiratory and cardiac disease, rheumatism, infantile paralysis, and neurosis. About 72% of applicants interviewed were accepted for training; but in a small proportion of these cases it was doubtful whether the training was an economic proposition, while in others it was uncertain whether the patient's medical condition was equal to the work on which he had set his heart.

In Scotland applicants for training are interviewed by panels on which sit representatives of the Ministry of Labour and National Service as well as technical men actually engaged in the training of disabled in centres, and a doctor experienced in industrial work: clinically difficult cases are referred to specialists (e.g., psychiatrist). The general policy is to give the applicant the benefit of any reasonable doubt, enlisting the coöperation of the medical officer at the training centre in his supervision during training. Training may be refused because there is no prospect (in the absence of sheltered employment not yet available) of the man becoming employable; or because he is either not yet fit for training or

1. Health and Industrial Efficiency. HM Stationery Office. 1943.

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regarded as permanently unsuited for it; or because he is already doing some work which appears as satisfactory as any for which he could be trained; or because by virtue of some previous industrial experience, he can be placed directly in some suitable work. Some of the men would have benefited from a period at a fitness centre before embarking on vocational training.

Laymen are usually ready enough to recognise the employment limitations of such gross surgical conditions as amputations; but even with the best intention they are much less appreciative of the difficulties arising from such conditions as cardiac disease and epilepsy, which usually present far greater placement problems. A combination of layman plus medical dictionary, however good, is no substitute for skilled medical assessment of the individual case, and may be a menace in dealing with the disabled, as in many other spheres.

The range of subjects in which training courses were available at the time of this survey was somewhat restricted by war needs; of 463 men accepted, 116 were for training in electric welding, 98 in fitting, 80 in machine-operating, 57 in instrument-making, 42 in commercial subjects, 34 in radio fault-finding, and 36 in a variety of other occupations—including sheet-metal work, store-keeping, and boot-repairing. Normally the length of training given varied with the occupation involved and with the severity of the disability. It might range from a 6-weeks course in store-keeping to 26 weeks or longer in commercial subjects or radio fault-finding. About 20% of the men accepted for training did not complete the training course, rather more than half of these having to stop on medical grounds and the others because of lack of aptitude or assiduity. In about half the cases where training was abandoned, it ended during the first month; and in nearly half of the cases in which training was abandoned, the men were unemployed six months afterwards.

Six months after the end of the course 82% of those who began it were in employment, while of untrained men followed up six months after their interview by the selection panel, 75% were in employment.

FACTORS INFLUENCING SUCCESS IN RESETTLEMENT

In the above sample the disabled of this war fared better than any other group: the percentage of them unemployed six months after completion of training, or (when they were not accepted for training) six months after their interview, was 14; whereas the corresponding percentage for the other groups was 24. The disabled of the last war fared worst of all, close on a third of them being found to be unemployed.

Age influenced the success of resettlement. Thus, among the men who were trained 15% of these under 35 were unemployed six months after completing training, as against 24% of these over 35. Of the trained men who were in employment, a higher proportion of the under-35's were working in the occupation in which they had been trained than was the case with older age-groups. Of men not accepted for training, 15% of the under-35's were not working six months after interview, compared with 37% of the over-35's. These figures suggest that, generally speaking, training did more to help to employment the older group of applicants: but this fact has to be taken in conjunction with the circumstances of wartime, and perhaps with a certain tightening of selection apt to operate in the decision to train an older man.

The success of resettlement was also influenced by duration of disability. Where the disabling condition had existed less than 5 years, 16% of the men were found on follow-up to be unemployed, and the figure was substantially the same for trained and untrained. Where the condition was of more than 5 years' duration, the percentage unemployed was 25. The unfavourable experience of the latter group, while apparent in the experience of both trained and untrained men, was particularly noticeable in the case of the untrained.

The success of resettlement varied with the subject in which training was given, but care must be exercised in assessing relative degrees of success, on account of factors operating in the selection of workers for particular jobs as well as the demands of the work concerned, and opportunities for remunerative employment after training. Thus of the six training courses chiefly employed in this study, the best results appeared to be obtained with fitting and electric welding, where the percentages of men unemployed after completing training were respectively 12 and 14 (table I). More of the men trained as welders were found to be working as such than was the case with fitters; training in fitting seems to have enabled a number of men to undertake and hold work not as fitters but in which their fitting experience was of value. At the other end of the scale, men trained in commercial work fared badly: 34% of them were unemployed six months after completing training, a result doubtless influenced in large measure by the fact that for many of these men commercial training seemed to offer the only alternative to unemployment, for which reason they were encouraged to see whether they could make the grade, though sometimes their educational background was such that they would find it difficult.

TABLE I—SUBSEQUENT EMPLOYMENT HISTORY OF MEN WHO COMMENCED TRAINING IN CERTAIN OCCUPATIONS

Occupation	% Working		% Not working
	As trained	Not as trained	
Electric welding ..	64	22	14
Fitting	47	41	12
Instrument-making ..	42	40	18
Radio fault-finding ..	32	44	24
Commercial	45	21	34
Machine-operating ..	51	25	24
Others	56	31	13
All occupations ..	51	31	18

TABLE II—SUBSEQUENT EMPLOYMENT HISTORY OF MEN WHO APPLIED FOR VOCATIONAL TRAINING

Not trained				Trained *			
					Working		
Total	Working	Not working	Disease group	Total	As trained	Not as trained	Not working
10	8	2	Peptic ulcer	35	14	14	7
13	11	2	Cardiac disease	32	12	10	10
6	4	2	Tuber- pulmonary	22	13	5	4
9	6	3	culosis non-pulmonary	27	11	9	7
17	15	2	Psychoneurosis	21	8	7	6
19	11	8	Organic nervous disease	39	20	11	8
64	47	17	Injuries	156	86	43	27
44	35	9	Others	131	71	45	15
182	137	45	.. Total ..	463	235	144	84

* Includes all men who embarked on training.

Efforts to help disabled men can succeed only along the lines of individual approach and appraisal; any attempt to mass-produce courses of action for groups of disabilities must fail. It is true that the results returned by different clinical groups vary broadly, as set out in table II, but even within groups there is enormous variation.

ADVICE ON CHOICE OF EMPLOYMENT

The basic questions to be considered in advising a disabled man have been well summarised in a manual issued under the authority of the division of industrial hygiene of the United States Public Health Service:

(1) What job can he work at productively (to which might be added "and happily")?
(2) Can he do the job proposed without being a danger to himself or to others?
(3) To what extent, if any, does he require continuing medical supervision?

These considerations imply a much closer association than usually exists between the doctor and the industry of the area in which he works—as general practitioner or

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as member of a hospital staff. American experience has shown that nearly every disabled person is capable of doing some useful work, unless he is ill in the common meaning of the term; but if all these disabled people are in fact to be resettled usefully into industry there must undoubtedly be a reorientation of the outlook of industry towards the disabled.

In general, return to old employment is the ideal, provided such employment is not likely to aggravate disability; for there is still something of the joy of craftsmanship that invests return to a man's trade with special satisfaction. It occasionally happens that the adaptability arising from a serious disability may enable a disabled worker to do a particular job better than most people—as for instance in the case of the recently reported successful employment of a blind typist in the reporting department of a radiological unit—while sometimes by simple modification of apparatus a severely disabled man may be enabled to do work which would otherwise be beyond him.

If a man is unlikely to be able to continue with reasonable satisfaction work for which his existing abilities suit him, his industrial future should be discussed with him in the light of all the circumstances. The decision whether a disabled man should be trained, and if so along what lines, can be determined only after careful consideration of the individual case, including the job possibilities of the area in which it is proposed that he should live and work. One man, aged 59, suffering from duodenal ulcer, all his days a miner, came with a suggestion for watch-repairing or radio fault-finding, both involving formidable changes for a man of his age: he was advised to do pit-head work, at which he has since worked quite successfully. The aim should be to make the disabled man thoroughly competent in some particular job rather than an indifferent handyman; and experience proves that many men can be trained to perform useful and exacting work, although they may have severe disabilities.

PARTICULAR DISABILITIES

In advising disabled men on employment one must keep ever in mind the importance of ability rather than disability; but it must also be remembered that some men, in their keenness, seek work beyond their physical compass.

In the sample analysed above, patients suffering from *cardiac disease* who were not accepted for training appeared to hold employment better than those who were accepted. For this there were two probable reasons: (1) where a cardiac patient was already doing any work reasonably well he was encouraged to remain in it, even though he hankered after something more exacting; and (2) experience which men gained during training sometimes led them to take up much heavier work than that in which they were placed.

For instance, a lad of 27, with rheumatic valvular disease had done no work since leaving school. It had been suggested to him that he should train in fitting. Medical opinion favoured a more sedentary job, and it was decided to train him in instrument-making. He did reasonably well at the training centre but on completion of his course he went to work as a grinder in an Ordnance factory; though he had the necessary technical ability he could not stand up to the physical strain involved. Six months after completing training he was unemployed.

Only experience can strike a fair balance between the desire to do the best for a disabled man and the reasonable use of resources. It is not enough to place the man in work that looks as if it ought to be suitable: touch must be kept with him until it is clear that he can do it without harm.

Much the same factors operate in the case of men suffering from bronchitis and other *respiratory disease*.

A patient of 23, boarded out of the Services for chronic bronchitis and asthma, soon found work as a carding operative in a woollen factory. Medical representations were at once made that this work was unsuitable, and inquiry showed that within a fortnight his complaint had been aggravated, and that he was off work. Some months later he was still unemployed.

A man of 20, who before the war was a jute worker, was boarded out of the Army for chronic adhesive pleurisy. He was recorded on discharge as suitable for machine operating (of which he had some experience) but as unfit for work in the jute industry. Nevertheless he returned to jute work, and within two weeks relapsed. He has since done well on a job not involving heavy exposure to dust.

Patients with *peptic ulcer* constitute a big problem, partly because of their number and partly because of the difficulty of securing for them, particularly in war-time, suitable food, work and working conditions. In dealing with these men a first essential is to make sure that the food they are eating is sufficient to allow them to undertake the work they wish to do. The aim should obviously be to place them in jobs enabling them to have regular and suitable meals, and so far as possible free from nervous tension. Many men are known to have suffered from peptic ulcer before joining the Services, but usually not then severe enough to interfere seriously with working capacity. After breakdown in the Services it is often some time before these men regain anything approaching the health and work equilibrium that was theirs before joining the Forces.

Experience suggests that as a rule ulcer patients do not do well in work involving much stooping or heavy lifting. It is well known that transport drivers are particularly prone to duodenal ulcer, and it is curious that so many men with this disability seem to have set their hearts on motor-driving.

The group of *psychoneurotics* is another in which men trained in new work were less successful, as regards employment, than those who returned as soon as possible to work they had previously done reasonably well. The term psychoneurosis covers a variety of clinical types but all show an instability that is apt to permeate the man's whole life and work. These people often flit uneasily from job to job, and few of them settle well to training in new work. They should be accepted for training only on psychiatric advice.

Men who have sustained *head injuries* often show personality change. They are apt to be diffuse and sensitive; sometimes they lack insight and often they are easily upset. They have difficulty in facing new surroundings and almost always work best near their own homes and in a familiar setting. They may be easily tired, and their tiredness sometimes exaggerates their special disabilities; so it is helpful to start them at work on short hours. They cannot undertake responsibility without undue anxiety and often have speech disorder. These men generally do better if they return to their old job, or to a modification of it, rather than try to learn something new.

One man, aged 38, invalided from the Army for severe post-concussional symptoms regarded as likely to be permanent and severe, was before the war employed as a colliery surface worker. He was confident that he could resume that employment, and though he had been advised to stay off work for some time he resumed surface work within a month of returning home. Not content with that, he soon afterwards became an underground worker, and has continued as such throughout the period of observation, reporting no troubles.

Disorders of vision sometimes present special difficulty. Loss of vision below horizontal level is particularly serious because of the insecurity it often engenders. Interference with field of vision is obviously important in relation to work on machines or where there is risk of injury from moving objects.

Epilepsy is always a serious problem in relation to employment, and epileptics often gravitate to work fraught with a heavy risk of personal injury to themselves or to others. But the risk and disability vary from one epileptic to another, as does the warning of the onset of attack which the sufferer receives. Employment in these cases can be determined only when the frequency and nature of attacks are accurately known and when the patient's condition has been reasonably stabilised. Epileptics notoriously tend to understate their disability.

CONCLUSIONS

Many factors influence resettlement in work. The attitude of employers is important, and especially the attitude of their foremen, who can do much to make or mar success: so too is the attitude of work-mates—who sometimes grow weary of the little extra help that may make all the difference—and the attitude and

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adaptability of the disabled man himself. In cases of injury the problems raised by compensation are often a hindrance to resettlement.

Light work within the industry in which the man was employed before he was incapacitated may be the most satisfactory means of restoring him to full fitness for work, but safeguards are necessary to prevent abuse of light work in this connexion and to see that he is not allowed to drift along indefinitely in light work when he in fact can do something better. The future of the severely disabled man is so much in the balance that anything that makes him even a little more efficient adds enormously to his prospect of successful resettlement. We must therefore secure the highest possible measure of physical and psychological repair.

Generally speaking, the longer the disability has lasted the less satisfactory the prognosis. Age, too, is important. In Denmark it has seldom been found economically worth while to train in new work a disabled man over the age of 35, and recent experience in this country certainly confirms that in general younger men do best in new employment. The care of the disabled should be set afoot as early as possible.

Geographical considerations may be weighty. Sometimes the district in which the man lives does not offer much scope for new employment, either because of the unrelieved heavy industry in it or because of limited facilities for any employment. Thus in Scotland it is not easy to find suitable work for disabled men in some areas of Lanarkshire or in some of the more remote parts of the Highlands. The previous industrial experience of the disabled man is of great importance: for instance, a man may be unable to follow his trade as a woodworker, but if he can be given a certain amount of commercial training and this can be related to his basic knowledge of the wood-working industry, then he may become a very valuable agent. In the presence of serious disability it is often best for the man to return to an industrial environment with which he is familiar; if possible, even to the factory in which he was formerly employed.

Disabled men encounter many difficulties, with medical, social and employment aspects closely interwoven. Some find their work too heavy; some cannot manage long journeys to and from work on top of a long working shift; some have difficulty in obtaining tools; some have difficulty in obtaining suitable clothing. Many have financial troubles; the wages they are able to earn are often too low for their responsibilities. Many chafe at what they think are irksome pension delays. Many have difficulty in getting a suitable house: a disabled man may find it almost as hard to make his way up and down the stairs of a high tenement house as it is to do his day's work. To be successful the approach to the problems of disability must be individual, and the disabled man must be kept in view until he is seen to be settled in work within his compass.

ARE THE SULPHONAMIDES MERELY BACTERISTATIC AGENTS?

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HUNDREDS of times in the last few years it has been stated that the sulphonamides merely inhibit the growth of susceptible organisms—they do not kill. But is it true?

In 1936 Colebrook, Buttle, and O'Meara stated that all streptococci were killed by two samples of serum taken respectively 3 and 5 hours after doses of sulphanilamide, whereas in the patient's serum before treatment the same streptococcus had grown out to many millions. In 1939 Wolff and Julius reported bactericidal effects when sulphanilamide was added to broth in vitro. In 1938 Hoare supplied further evidence. In his experiments he frequently found complete killing of hæmolytic streptococci by normal human serum to which sulphanilamide had been added. Such killing was obtained with four different strains. In his experiments precautions were taken (dilution to more than 1 in a million) to avoid carrying over a growth-inhibitory amount of sulphanilamide in the explanted samples of serum, but the results would have been still more conclusive had he explanted into medium containing *para*-aminobenzoic acid. The antagonism between this substance and the sulphonamides was not known, however, when the experiments were done.

In order to obtain that further degree of certainty we have recently carried out such tests. Instead of serum we used a nutrient broth to which lysed horse blood had been added, to render it free from sulphonamide-antagonisers (Harper and Cawston 1945).

1 c.cm. volumes of this broth, with and without added sulphonamide (10 mg. per 100 c.cm.), were implanted with a diluted culture of hæmolytic streptococcus. Viable counts were made by explanting an aliquot part of each tube (100 c.mm.) in melted blood-agar plus *p*-aminobenzoic acid (*a*) immediately, (*b*) after 6 hours' incubation. After a further 18 hours' incubation the remaining 0·8 c.cm. of infected broth was explanted in the same way. The results were as shown in the table.

Strain and type	Drug and concentration in the broth (mg. per 100 c.cm.)	Number of colonies grown from: 0·1 c.cm. sample		Whole 0·8 c.cm. remaining after 24 hours' incubation
		Before incubation	After 6 hours' incubation	
Hunter *	Sulphanilamide 10	83	302	0
"	Nil	80	thousands	millions
Pilot *	Sulphanilamide 10	101	69	1
"	Nil	112	thousands	millions
Tomlinson (B3264)	Sulphanilamide 10	110	550	0
"	Nil	101	thousands	millions
Lloyd (25)	Sulphanilamide 10	125	89	0
"	Nil	118	200	millions
Hunter	Sulphapyridine 10	56	152	0
"	Nil	66	millions	millions
Hunter	Sulphathiazole 10	60	120	0
"	Nil	64	millions	millions

* Unidentified type

It will be seen that, with the exception of the one experiment in which a single colony grew out from the sulphonamide broth after 24 hours' incubation, there was complete killing of the 4 strains of streptococci; and that this result was obtained with sulphanilamide, sulphapyridine, and sulphathiazole. All three substances evidently exerted a bactericidal as well as a bacteristatic effect. It was not the purpose of these experiments to determine the limit of bactericidal effect obtainable with this concentration of sulphonamide, but rather to get unequivocal assurance that no cocci remained viable after a few hours—ruling out thereby a mere bacteristatic effect. Other experiments carried out by one of us (L. C.), and those reported by Hoare, indicate that serum containing sulphonamides will often reduce the viable count within 24 hours from several thousand to less than a hundred. Killing of that order by all the body fluids may well play an important part in suppressing an incipient infection by susceptible organisms.

There remains the more academic question: What bearing have these bactericidal effects on the mechanism of sulphonamide action? Did the streptococci die off within 24 hours simply because their normal metabolic processes were interfered with by the sulphonamides (Woods 1940), or does some other mechanism come into play? The fact that hæmolytic streptococci are known to survive for weeks or months without added fresh nutriment—e.g., in the dried state—suggests that intereference with their metabolism is not enough to account for their rapid changing in the above experiments to the non-viable state.

REFERENCES

Colebrook, L., Buttle, G. A. H., O'Meara, R. A. Q. (1936) *Lancet*, ii, 1323.
Harper, G. J., Cawston, W. C. *J. Path. Bact.* In the press.
Hoare, E. D. (1938) *Lancet*, i, 655.
Wolff, L. K., Julius, H. W. (1939) *Ann Inst. Pasteur*, **62**, 616.
Woods, D. D. (1940) *Brit. J. exp. Path.* **21**, 74.

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PENICILLIN IN CLOSTRIDIAL INFECTIONS

JUNE 8 TO JULY 24, 1944

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From the Penicillin Unit of an EMS Hospital

THIS first 6 weeks after D-day, before medical services could be fully organised in France, provided an opportunity in a transit hospital in England to make some observations on the influence of penicillin on the incidence and course of gas-gangrene and allied conditions. Cases in this hospital and a second series (series 2) observed in the Radcliffe Penicillin Unit of the Medical Research Council, all treated prophylactically with penicillin, provided a third opportunity—that of studying the clinical effects of clostridial infections in the absence of *Staph. aureus* or *Strep. hæmolyticus*.

The purpose of this report‡ is to demonstrate, first, that the rôle of penicillin should be to prevent the development of gas-gangrene rather than to treat the established condition; secondly, that inadequate "prophylactic" administration may lead to a serious clinical picture very different from that associated with either gas-gangrene or anaerobic cellulitis. The paper describes what was seen. We do not claim to distinguish between one clinical entity and another but prefer to consider them as different gradations of the same disease, rather than to split them into water-tight compartments. The majority of wounds admitted to this hospital were 2–4 days old, by which time most cases of gas-gangrene in the latest reports have been recognised (Jeffrey and Thomson 1944, Cutler and Sandusky 1944).

INCIDENCE

During the period June 8 to July 24, 3907 battle casualties were admitted; 436 (11%) of these had been treated with injections of penicillin. These, by virtue of War Office instructions,§ were those most liable to suffer from gas-gangrene—i.e., wounds with extensive laceration of muscle (especially buttock or thigh), compound fractures, arterial damage, many retained foreign bodies, much contamination, and also those in men who had lain out for a considerable time. Examination of these cases revealed that 94% conformed to these instructions. The treatment prescribed was an initial injection of 100,000 units, followed in about 6 hours by 45,000–50,000 units at 4- or 5-hourly intervals till definitive surgical treatment could be carried out.

A comparison is drawn, therefore, between the incidence—from the day of wounding till admission to this EMS hospital—in one class of case which was not considered likely to develop gas-gangrene and that in another class specially selected for the opposite reason. Had the selection been perfect, cases of gas-gangrene and allied conditions should only have developed in the second class.

TABLE I—PROPHYLACTIC TREATMENT GIVEN ON DAY OF WOUNDING IN 410 CASES[1] LIABLE TO DEVELOP GAS-GANGRENE

Treatment	% of cases	Treatment	% of cases
ATS	60	AGGS	25
Penicillin ..	42	Surgical intervention	23
Sulphonamides	40		

1. No record of remaining 26.
ATS = anti-tetanus serum. AGGS = anti-gas-gangrene serum.

The incidence of cases diagnosed as "gas-gangrene," "suspected gas-gangrene," or "gas cellulitis" in class I, not treated prophylactically with penicillin, was 28 in 3471 (gas-gangrene 5, 0·14%)‖ or 0·81%. The incidence in class II, treated prophylactically with penicillin, was 2 in 436 (gas-gangrene 0), or 0·46%. Since prophylaxis in any form, for its optimal effect, should begin immediately after wounding, table I indicates the different factors in the second class influencing incidence at the earliest moment. It is thus seen that reliance for protection at this early stage was placed on chemotherapy in almost twice as many cases as on surgical intervention.¶

MANIFEST INFECTION

No deaths occurred in this hospital during the time under consideration, although care was taken to keep all serious cases till they appeared to be out of danger and all cases of "gas" diagnosed here were retained till full healing had taken place. The cases studied have been divided into the following clinical groupings—

Diagnosed as "gas"

	No.
Group 1.—First recognised at the EMS hospital	16
Group 2.—Recognised and treated before admission:	
(A) retained 6	
(B) sent on 8	14**
	30

Not diagnosed as "gas"

	Series 1	Series 2
Group 3.—With "dirty" lacerated wounds treated earlier with prophylactic penicillin	9 ..	27
Group 4.—With "clean" lacerated wounds ..	11 ..	22

** These figures include 1 prisoner-of-war not in the investigation.

CASES FIRST RECOGNISED AT THE EMS HOSPITAL

Group 1 comprises all the cases which were first diagnosed as "gas" on admission and were followed throughout. The findings in this group have been made a basis for interpreting those in the other groups and therefore merit the closest study.

Clinical diagnosis.—The diagnosis of gas infection was made by the surgeons on the following clinical criteria: swelling and colour of muscles, thin brownish discharge, presence of gas, smell, discoloration of surrounding skin, and general condition of the patient. It must be emphasised that none of these cases had reached the stage of fulminating gas-gangrene as commonly recognised by the surgeon. They would be classified as "anaerobic cellulitis" or "local gas-gangrene" of muscle. The whole aim in treatment was to recognise and treat cases before they reached a stage that may be regarded as the terminal event in an infection of a muscle, no matter how rapidly reached.

In all but 3 instances the most striking feature was the appearance of the muscles. They had greyish sloughing surfaces, were greatly swollen, and were herniating out of wounds or causing very considerable swelling and pain in the limb involved. A thin brownish discharge, odour, and gas bubbles were also present. Discoloration of the surrounding skin over a wide area was noted in some instances. Necrotic muscle which did not contract or bleed on being cut was found reaching to varying depths but not necessarily involving the whole belly of a muscle. The remaining 3 cases were diagnosed either on the widespread presence of gas, discoloration, and swelling of skin, or on the increasing pain, pallor, pulse-rate, and swelling of muscles during the first few hours after admission.

Pulse-rates were abnormally high in relation to temperatures. Greyish pallor and lack of interest in their surroundings distinguished these patients from others in the same convoy.

Bacteriological diagnosis was made both on film and culture. Without exception both supported the diagnosis by showing the presence of gram-positive bacilli which grew only under anaerobic conditions. *Staph. aureus* and *Strep. hæmolyticus* accompanied the clostridia in 6 cases. In 11 instances (which include 2 cases in group 2A) cultures were sent to the Lister Institute for further investigation; *Clostridium welchii* was found in every specimen examined and was accompanied by *Cl. sporogenes* in all but one, while *Cl. tertium* and *Cl. histolyticum* were found in 3 others.

Previous history.—The age of these wounds varied from 1 to 4 days (description in table II). In none had any penicillin or sulphonamides been administered or surgery performed on the day of wounding. One case only had received gas-gangrene antiserum on this day.

* Medical students of St. Thomas's Hospital.
† Appointed by the Medical Research Council.
‡ A fuller account and more detailed tables have been deposited with the Penicillin Trials Committee of the Medical Research Council.
§ AMD7/90B/44.
‖ All diagnosed before reaching the EMS hospital.

¶ Summary of report to MRC on transit cases.

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TABLE II — PREVIOUS TREATMENT AND CONDITION ON ADMISSION IN 16 CASES OF GROUP 1

PREVIOUS TREATMENT

	Cases		Cases
Surgical { Incision	2	Sulphonamides (7·5–20 g.)	9
Surgical { Excision	2		
Anti-g.-g. serum	2	Penicillin* (3–4 injections)	2

CONDITION ON ADMISSION

Day from wounding:		*State of wound:*	
1st	1	Lacerations	16
2nd	8	Foreign bodies	10
3rd	3	Fractures	6
4th	4	Arterial damage	3
Site:		Odour	13
Buttock	3	Skin discoloration	3
Thigh	3	Nerve lesions	8
Leg	3	Muscles swollen	16
Forearm	3	Muscles discoloured	15
Arm	2	Muscles non-contractile	15
Shoulder	1	Muscles contained gas	11†
Foot	1	*Bacteriological findings:*	
Temperature (° F):		Clostridia‡	16
99° or less	4	*Staph. aureus*	5
99°–101°	10	Hæmolytic strep.	2
101°–103°	2	*Staph. albus*	9
Pulse-rate per min.:		*Bact. coli*	2
109 or less	2	Non-hæm. strep.	2
110–119	6	Diphtheroids	3
120–140	8		
Pallor	14†		

* Penicillin not begun till 1st and 2nd days after wounding respectively. Initial dose 80,000 and 100,000 units, subsequent 40–50 thousand.
† Remainder not recorded.
‡ Film and culture. *Cl. welchii* found in all specimens sent to Lister Institute (11).

Treatment in the EMS hospital.—The patients were brought under treatment at the earliest possible moment after diagnosis. The following programme was found the most satisfactory—

Immediate injection of 20,000 units of penicillin, repeated at the beginning of operation and thereafter 3-hourly, or by intramuscular drip, for from 10–15 days.

Immediate injection of 50–100 thousand units of gas-gangrene antiserum, repeated if considered necessary.

Wide incision of wounds and excision of only definitely necrotic muscle. No sulphonamides were given.

The lengthy penicillin treatment was thought necessary owing to the observation that the swelling of muscles, clostridial infection, and evidences of toxæmia persisted much longer than the unhealthy appearance of the muscle surfaces.

As a necessary precaution against secondary infection, penicillin paste, 250 units per gramme, was applied locally as soon as systemic treatment was discontinued and till secondary suture or skin-graft could be satisfactorily carried out.

A little further excision was necessary in 4 cases. Ligature of a vessel for secondary hæmorrhage and sequestrectomy of the spine of a scapula were the only other operative procedures. Blood-transfusions were given to 4 cases. Sedatives were given freely, because the patients were markedly restless and anxious.

Progress was steady throughout. There was little, if any, extension of the necrotic process and surfaces looked clean and became covered with granulations in from a week to a fortnight. The swelling of muscle bellies took longer to subside and was noticeable in some cases as long as 18 days after excision. The general condition of the patients however gave more cause for concern than did the appearance of the wounds. The abnormal mental condition, pallor, and rapid pulse-rate were the most distinctive and protracted features of these patients' condition (see table III).

In the second series, where no case received gas-gangrene antiserum, the 6 cases of persistent *Cl. welchii* infection registered pulse-rates of over 90 per min. for 4–12 weeks after admission, whereas, of the remaining cases, the mean time for the rate to fall below this figure was 1·5 weeks.

Bacteriological progress was followed by swabs taken, on an average, twice a week for the first fortnight, and then at gradually increasing intervals till full healing had taken place. The most noteworthy finding was the length of time before gram-positive rods disappeared from films and anaerobic cultures (table III). A noticeable feature preceding disappearance from films was the increase in atypical morphological forms, while many bacilli showed fragmentation and loss of fixing power for Gram's stain. In spite of increased pus formation, the absence of phagocytosis was noteworthy. The cultural findings were confirmed in 11 cases whose specimens were subjected to more detailed study; *Cl. welchii* was present for as long as or longer than, gram-positive anaerobes were found in cultures.

This period during which clostridia were found seemed to correspond with the duration of toxic symptoms in the patient, with the proviso that small pieces of slough not removed from the surface of a wound would consistently harbour anaerobes when the patient himself was well on towards convalescence.

Gram-positive secondary infection occurred in half the cases. *Staph. aureus* was the usual invader but *Strep. hæmolyticus* appeared in one wound. Only once, however, did they appear in the first 10 days. By this time the wounds were well covered with granulations and so protected from any spread of infection into the deeper tissues. The wounds did not give any clinical evidence of sepsis before the organisms were detected, but they were undoubtedly associated with the breaking down of suture lines and the partial failure of skin-grafts. When daily dressings of penicillin paste were started as soon as systemic treatment was stopped these secondary invaders ceased to be a source of trouble.

Progress during convalescence.—The hæmoglobin and red-cell count were estimated in two-thirds of the cases. When this was done in the acute phase the Hb was in the vicinity of 30–50%, and in the cases examined 6 weeks after first treatment it had reached 100–110%.

By 3–7 weeks no sinuses remained and wounds were superficial. The last remaining granulations were covered with epithelium in from 4 to 14 weeks, and this included a patient whose whole supraspinatus fossa had to fill with granulations before full healing could take place.

TABLE III—PENICILLIN THERAPY AND PROGRESS IN 22 CASES OF GROUPS 1 AND 2A (FIGURES = NO. OF CASES)

Day from diagnosis	6–8	9–11	12–15	16–32	33–64	65–128
Systemic penicillin* completed	8	9	5	..	..	..
Clostridia disappeared:						
from film†	8	2	5	6	..	..
from culture	4	5	4	9	..	..
Pulse-rate below 90 per min.†	3	2	..	11	5	..
Wounds healed	..	..	..	3	16	3

* Local applications of penicillin used after systemic discontinued.
† 1 case not recorded.

The investigation was not considered complete till all cases were taking active exercise, with their wounds fully healed and no other treatment but suturing of nerves and physiotherapy required. Thus it could be said with some certainty that no ill effects from infection or toxæmia remained.

GROUP 2

Cases first diagnosed and treated elsewhere number 13 (table IV). Anaerobic infection was recognised on days 0–3; gas-gangrene on days 1–2. It was in this group only that gas-gangrene occurred and amputation was found necessary. Unfortunately there was no means of comparing the condition of the wounds before gas-gangrene supervened with those in group 1. Penicillin had been administered to all but one therapeutically but to none prophylactically. The administration of sulphonamides and gas-gangrene antiserum was not a constant feature of their treatment. Clostridia were cultivated from every case retained, even from an amputation stump. An abundant growth of *Staph. aureus* was obtained only from the case not treated with penicillin.

Two of these cases deserve mention—

The case in which no surgical intervention was carried out was diagnosed as suspected gas-gangrene on the day of wounding; this man received "5 c.cm." only of gas-gangrene antiserum and regular doses of penicillin from day 1. He

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TABLE IV—PREVIOUS HISTORY AND TREATMENT OF 13 CASES IN GROUP 2A AND B

ONSET OF INFECTION	Cases
Day from wounding:	
0	2
1st	5
2nd	4
3rd	2
Site:	
Thigh	2
Leg	4
Forearm	2
Arm	2
Foot	2
Abdominal wall	1
Description:	
"Gas-gangrene suspected"	6
"Gas present"	2
"Gas-gangrene"	5

FIRST TREATMENT:	Cases
Surgical:	
None	1
Excision	7
Amputation	5
Anti-g.-g. serum (units):	
Nil	1
No record	3
11,000	1
45,000 and over	8
Sulphonamides (g.):	
Nil	4
No record	1
10–15	5
20–30	3
*Penicillin** (injections per day):	
Nil	1
2–3	2
4–5	8
Drip	2
Bact. culture on admission:	
Not done	7
Clostridia	6
Staph. aureus	2
Hæm. strep.	0
Staph. albus	4
Bact. coli	1

* Initial dose usually 100,000 units; subsequent doses usually 40,000–50,000 units.

reached the EMS hospital on the 3rd day after wounding with the muscles of his calf yellow-red and herniating out of his wound. A foreign body was found embedded in his calf which had severed his post-tibial artery. Even without early excision or sulphonamides, the gangrenous process had obviously not extended.

The second case was one in which early extensive excision of thigh muscles, removal of a foreign body, and 50,000 units of gas-gangrene antiserum had failed to prevent extension of the process into the abdominal wall. When taken to the theatre for amputation on the 2nd day his condition had appeared too serious for the surgeon to risk operation. The regular administration of penicillin in conjunction with repeated injections of 36,000 units of gas-gangrene antiserum over the next 7 days was followed by improvement in general condition and the appearance of a clean granulating wound by the 12th day, when he was sent to the EMS hospital.

Clinically the 6 cases retained in the hospital closely resembled those in the first group at comparable stages, but the pallor and peculiar mentality associated with this condition was particularly well-marked and one case was delirious for 2 days. Treatment and progress followed the same lines as in group 1, so that as a separate group this calls for no comment.

Seven cases were sent on from the EMS hospital because they were in good condition. An attempt to follow progress in these resulted in 5 replies. All of these 5 men were convalescent or had their wounds fully healed after periods of 1–3 months.

GROUP 3

The 10 men in this group had wounds which were among the most seriously lacerated in the convoys. They were all "PEN" labelled cases and were studied as a comparison with those diagnosed as "gas" in the hospital during the period under survey. All were retained because of their severity. Their wounds were 3–15 days old on admission and had ragged greyish sloughing surfaces and much discharge, either thin and grey or bloody and purulent. The septic appearance was however confined to the torn muscles, there being no flush of the surrounding part or œdema of the skin or subcutaneous tissues. Nearly all the patients looked ill on admission, so the outstanding clinical differences between this and groups 1 and 2 were the extensive laceration, the absence of gas and of muscle swelling, and the lower pulse-rate.

Previous treatment.—Previous surgery had been minimal, but penicillin had been administered to all cases from day 0–2 following wounding, and, with one exception, continued till admission to the EMS hospital. Antiserum and sulphonamide administration are seen in table v. The two cases with the most extensive lacerations had only a negligible amount of sulphonamides—2·5 g. in one; none in the other.

Bacteriological findings.—All the wounds produced gram-positive bacilli in the films and a moderate to heavy growth of clostridia, but, with the exception of a scanty growth in 1 case, no other recognised pathogens were found.

Treatment.—Penicillin was continued on much the same lines as that already described. Gas-gangrene antiserum was given to one case only.

Surgical intervention.—Excision of dead muscle was necessary in several cases. Removal of loose bone and of tight 'Vaseline' gauze plugging, and the trimming up of the hanging fragments of tissue from a traumatic amputation were also carried out. The insertion of Steinmann's pins had no untoward results and one amputation was necessary.

This case provided perhaps the most suitable conditions for the development of gas-gangrene. He had a 9-day-old perforating wound of the upper arm with a severely comminuted fracture of the humerus. The entry and exit wounds were small, but, because of shock, no previous operation had been performed, the limb being enclosed in a plaster spica. He had been given, in regular dosage during 1 week, enough penicillin to treat a pyogenic infection therapeutically for a month; 9000 units only of gas-gangrene antiserum had been injected on day 1, and no sulphonamide administration was recorded. When the wounds were explored in this hospital no pulsation was felt in the brachial artery. Every muscle of the arm was lacerated, the triceps pultaceous, and the ulnar nerve severed. A quantity of ill-smelling bloody pus flowed out of the wounds as they were opened. Amputation was performed of necessity, for there was little continuity of tissue apart from skin. Though the patient's condition after operation caused considerable anxiety he made a quick recovery and looked bright and well within 5 days of his operation.

In contradistinction to the case just described, who received early and enormous quantities of penicillin,

TABLE V—PREVIOUS TREATMENT AND CONDITION ON ADMISSION IN 10 CASES OF GROUP 3

PREVIOUS TREATMENT

	Cases
Surgical:	
Nil	3
Toilet	2
Incision	2
Excision	3
Anti-g.-g. serum (units):	
Nil	2
9000–16,000	4
20,000–60,000	4
Sulphonamides (g.)	
Nil	4
10–14	2
20 or over	4
*Penicillin** (injections per day):	
2–3	3
4–8	7

CONDITION ON ADMISSION

Day from wounding:	
2nd and 3rd	3
5th and 6th	4
8th and 9th	2
15th	1
Site:	
Buttock, thigh, &c.	3
Whole lower limb, &c.	2
Whole upper limb	1
Thigh	2
Arm	2
Temperature (°F)	
99°–101°	10
Pulse-rate per min.	
99 or less	6
100–116	4
State of wound:	
Severe lacerations	10
Foreign bodies	4
Fractures	8
Arterial damage	2
Odour	6†
Pus	5
Muscles swollen‡	1
Muscles discoloured	8
Muscles non-contractile	5
Muscles contained gas‡	2
Bacteriological findings:	
Clostridia§	10
Staph. aureus‡	1
Hæm. strep.‡	1
Staph. albus	4
Bact. coli	5
Non-hæm. strep.	2
Diphtheroids	3

* Initial dose usually 100,000 units; subsequent doses usually 40,000–50,000 units.
† 3 cases with no record. ‡ Scanty only. § Film and culture.

another calls for special comment since it may indicate that inadequate penicillin therapy can mask local signs of gas-gangrene though not prevent a profound toxæmia.

His injury, a compound comminuted fracture of the femur, received no medical attention for 21 hours after wounding. Before admission to this hospital some excision and plaster-of-paris splinting had been carried out. Large doses of sulphonamides, in all 54 g. in about 2 weeks, had been administered. Penicillin was not given till day 2, and then for a week; 16,000 units of gas-gangrene antiserum was injected on day 6, although there were notes to the effect that there was "no sign of G-G though wound is heavily infected." When inspected in this hospital 15 days after wounding, the wound had some greenish slimy discharge in it and some strands of necrotic greenish muscle, but most of the muscle looked "red and healthy." The film was teeming with gram-positive bacilli, and no other pathogens except clostridia were cultivated from the wound swab.

The patient was obviously ill and a further course of sulphonamides was discontinued when it was discovered that

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he had a leucopenia of 3000 per c.mm., ulcerated fauces, and mental derangement. A rising temperature could not be accounted for, and, though no diagnosis could be made, as a measure of despair, a further course of penicillin was given for 6 days only. The temperature partly subsided but fever persisted for many weeks, and a pulse-rate of 120 was still being recorded 4 months after wounding. It is also noteworthy that *Cl. welchii* were cultivated from his sinus after this period had elapsed.

GROUP 4

Group 4 were selected as clean wounds irrespective of previous penicillin therapy. They are used simply as a bacteriological comparison with the previous "septic" cases in which clostridia were invariably found (table VI).

TABLE VI—BACTERIA FOUND IN "CLEAN" AND "SEPTIC" WOUNDS IN GROUPS 4 AND 3 (NO. OF WOUNDS)

Group	Type	Total	Sterile	Clos.		*S. aur.*	*H. strep.*	Others†
				Film	Cult.			
4.	Clean	10	5	1 (±)	5 (±)	2	0	4
3.	Dirty*	10	0	10	10	1 (±)	1 (±)	5

* Or "septic."
† Others: *Staph. albus*, non-hæmolytic streptococci, *Bact. coli*, diphtheroids and G + air contaminants.

The second series of 49 consecutive lacerated wounds treated elsewhere and 1–5 days old (table VII) were also

TABLE VII—BACTERIA IN 49 CONSECUTIVE LACERATED WOUNDS OF SERIES 2 (NO. OF WOUNDS)

Group	Type	Total	Sterile	Clos.		*S. aur.*	*H. strep.*	Others†
				Film	Cult.			
4.	Clean	22	10	2	5‡	5	0	8
3.	Dirty*	27	0	21	25¶	2	1	1

* Or "septic."
† Others: Gram-negative bacilli, *Staph. albus*, and non-hæmolytic streptococci.
‡ *Cl. welchii* in 1 wound. ¶ *Cl. welchii* in at least 8 wounds.

compared from this point of view. The "clean" wounds where clostridia were found were little lacerated and thus provided a poor habitat in which their scanty numbers could multiply. Those that were "septic" almost invariably harboured clostridia, almost to the exclusion of other pathogens.

Blood-urea was not estimated in the EMS hospital cases but series 2 provides an indication of the effect of clostridial infection on their level. Estimates were made at fortnightly intervals on all cases. Only those which remained over 50 mg. per 100 c.cm. during the first fortnight after wounding are tabulated (table VIII). A

TABLE VIII—BLOOD-UREA LEVELS IN 48 CASES OF SERIES 2 (NO. OF CASES)

Wounds	Total	Blood-urea over 50 mg. per 100 c.cm.	Proportion raised
With clostridia	23	8	1 : 3
Without clostridia	25	3	1 : 8

second course of penicillin in one patient who received very perfunctory prophylactic treatment was followed by a steady improvement in symptoms and drop in his blood-urea from 420 mg. per 100 c.cm. to normal limits within 3 weeks.

DISCUSSION

Earlier experimental work has shown the protective value of parenteral penicillin against overwhelming inoculations of clostridia (Chain et al. 1940, Hac 1944). Incontrovertible proof of the part played by prophylactic penicillin in influencing the incidence and the course of clostridial infections in man cannot be offered in this small series of cases, nor would anyone care to withhold chemotherapy in order to obtain a significant number of controls. Possibly the incidence of gas-gangrene in the German Army opposing us since D-day may form a basis of comparison later.

Again no claim can be made that any of the 31 cases of clostridial infection followed in this hospital—groups 1, 2A, and 3—would have passed on to the stage of gas-gangrene. The fact can simply be recorded that no case among the 3907 battle casualties did develop it here and the wounds were of the kinds considered most liable to do so. A death from gas-gangrene did occur in a case admitted later than this series when the regime described here was not observed.

The diagnosis of "gas-gangrene" seems to be open to many different interpretations, but from the point of view of chemotherapy it is better to regard clostridial infections of muscle not as separate clinical entities but as a single process that may pass through many stages, no matter how rapidly, from superficial infection to extensive gangrene. "In histological sections clostridia have been found far beyond the edge of the gangrene, in the interstitial tissue between the healthy fibres" (McNee and Shaw Dunn 1917), indicating that bacteria are invading the tissues before gangrene is evident. For this reason, failing prophylactic treatment, the earlier infection is recognised the better chance there will be of arresting its progress. The suggestion is made that swelling of muscles should be taken into account in an attempt to make this early diagnosis.

Chemotherapy can only be expected to play a part where circulatory access to the infected area is adequate; where a major artery is severed and no collateral circulation established there is no means of carrying the antibacterial agent to the affected part. In these cases the infection must be expected to spread at least as far as the barrier set up by the circulating drug.

The cases in group 1, first diagnosed as "gas" at the EMS hospital, provide some valuable information, and help to interpret findings in the other groups—

(1) that bacteriological findings supported the clinical diagnosis both in film and culture;
(2) that clostridia persisted for a considerably longer period than was suggested by the clean surface of the wound, but that this period was more nearly commensurate with the time during which the swelling of muscles persisted;
(3) that "toxæmia" was a well-marked and protracted feature of most cases;
(4) that infection did not spread after penicillin therapy combined with conservative surgery had been instituted;
(5) that local applications of penicillin provided a protection against secondary infection until the most suitable time for reparative surgery.

The use of gas-gangrene antiserum was not considered in any way to confuse the issue of the investigation. The employment of a powerful antibacterial agent to check the spread of an infection could not be expected to reduce the circulation of the toxins already present, nor could there be any guarantee that clostridia lying in the muscle would not, though prevented from multiplying, still generate toxins until they eventually disappeared. In the same way, surgery was manifestly required to remove dead tissue which might continually renew infection and maintain toxin formation, and was beyond the reach of circulating drug and antibodies.

It is regrettable that during the stress of the convoys blood-urea estimations were not made at the hospital for cases have already been reported who have died in uræmia during a course of penicillin therapy which was instituted after gas-gangrene was well established (Jeffrey and Thomson 1944, and unpublished reports), and a raised blood-urea seems often to be present even before the well-developed stage of gas-gangrene (table VIII).

Group 2, diagnosed and treated before reaching the EMS hospital, calls for some comment. Amputation beyond the sight of visible infection was not a guarantee that clostridia were absent (see also McNee and Shaw Dunn 1917). A later case bore out clinically this bacteriological finding—a man died in the hospital from gas-gangrene without receiving penicillin after amputation had been performed elsewhere.

That "gas" diagnosed on the day of wounding could be stopped from spreading simply by the use of systemic

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penicillin and a minimum dose of gas-gangrene antiserum seems to be demonstrated by a case in group 2. The muscles when examined on the 3rd day were obviously pathological but there was little necrosis.

The "septic" or "dirty" cases in group 3, previously treated with penicillin and not diagnosed as "gas," all harboured clostridia but, with one exception, no other recognised pathogen, and they had all received, if not the prescribed penicillin treatment, at least a considerable number of injections. The question arises why, since they were undoubtedly pathological, provided the most favourable conditions, and were invaded by no other pathogen but clostridia, did they neither pass on to "gas-gangrene" or even show the additional clinical signs of swollen muscles and presence of "gas"? No answer can be incontrovertible, but their one common factor in treatment was penicillin. The suggestion is made that the drug prevented any spread beyond the superficial layers of the torn and devitalised muscles. Even this limited infection was apparently sufficient, at any rate in one case, to produce a profound toxæmia, counteracted as it was by no more than 16,000 units of gas-gangrene antiserum.

A satisfactory basic dosage and time interval has been worked out for the penicillin therapy of pyogenic infections—15,000 units 3-hourly—but not for those caused by anaerobes. Obviously in so rapidly spreading a condition as gas-gangrene the optimum treatment is prophylactic, beginning by an injection immediately after wounding. The intervals recommended by the War Office have not yet been demonstrated to be adequate for the purpose, though the doses are much larger than those commonly used. It is possible, however, that a wound may be flooded from a large dose of penicillin and retain the drug considerably longer than it is demonstrable in the blood-stream. Even if the bacteriostasis in the blood-stream was intermittent (and very few cases received even the number of doses prescribed), it must have had a considerable effect, as shown by the small proportion of wounds so treated which harboured *Staph. aureus* and *Strep. hæmolyticus* (Berry et al. 1944). Clostridia, however, persisted in a higher proportion, and though producing no typical local signs of gas-gangrene appeared in some cases to give rise to generalised symptoms when only partially controlled by a short or interrupted course of penicillin. Such cases might confuse the surgeon at the base hospital by showing only local sepsis but a profound toxæmia with a high blood-urea from which the patient might not recover.

The clean wounds (group 4, series 1 and 2) were selected simply on clinical grounds in order to compare their bacterial flora with the preceding groups. The high proportion of sterile wounds and the absence or scanty growth of clostridia from them are both notable features. It seems possible that a lacerated wound where these organisms are not present remains to all appearances clean if under the influence of penicillin. On the other hand, clostridia may produce a "septic" wound, as distinct from "anaerobic cellulitis" or "gas-gangrene," providing requisite conditions for their multiplication are supplied (as exemplified in group 3, series 1 and 2).

SUMMARY

A study of the manifestation of clostridial infection among nearly 4000 consecutive battle casualties has been made with special reference to the part played by penicillin in combating them.

Some indication that penicillin has lowered the incidence of gas-gangrene is given by comparing the figures in the group not considered liable to develop gas-gangrene—0·14%—with those in the "PEN" label group—specially selected for this liability—0 cases.

It is suggested that cases liable to develop gas-gangrene should receive a penicillin injection as soon as possible after wounding and treatment should be continued till granulations have formed on the wound surface.

A satisfactory treatment of cases diagnosed as local gas-gangrene or "anaerobic cellulitis" has been evolved. This includes intramuscular penicillin for 10–15 days, gas-gangrene antiserum, wide incision of wounds with excision of necrotic muscle, and local application of penicillin paste after the systemic course has ended.

Clostridia can be solely responsible for wound sepsis, and not only associated with the clinical entities described as "anaerobic cellulitis" and "gas-gangrene."

With a short or interrupted course of penicillin a profound or protracted toxæmia may result in spite of the absence of typical local signs. In such cases the diagnosis may be missed and the patient fail to receive further penicillin or gas-gangrene antiserum.

This work could not have been carried out without the help given by the staff of the EMS hospital, lay, administrative, nursing, surgical, and laboratory. Other students of St. Thomas's Hospital as well as the authors took part in collecting the data and were unstinted in their efforts to make the records complete. Captain A. E. Brewer, RAMC, is thanked for his assistance with the bacteriological investigations, and Dr. M. G. Macfarlane of the Lister Institute for forwarding the relevant bacteriological reports. The Radcliffe Penicillin Unit of the Medical Research Council gave permission for the figures relating to their cases to be published. Thanks are due to Drs. W. R. Ross and E. C. Turton for their help in this work. Dr. M. A. Jennings and Lieut.-Colonel J. S. Jeffrey gave valuable advice and criticism of the text.

REFERENCES

Berry, J., Fisher, G. H., Florey, M. E., Grimson, T. W., Reynolds, J. A., Secar, P. G., Shaw, J. G. H., Williams, P. M. de C. (1944) Report to MRC of Penicillin-treated cases passing through a Transit Hospital (unpublished).

Chain, E., Florey, H. W., Gardiner, A. D., Heatley, N. G., Jennings, M. A., Orr-Ewing, J., Sanders, W. G. (1940) *Lancet*, ii, 226.

Cutler, E. C. Sandusky, W. R. (1944) *Brit. J. Surg.* **32**, 168.

Hac, L. R. (1944) *J. infect. Dis.* **74**, 164.

Jeffrey, J. S., Thomson, S. (1944) *Brit. J. Surg.* **32**, 159.

MacLennan, J. D. (1943) *Lancet*, ii, 63, 94, and 123.

McIntosh, J., Selbie, F. R. (1942) *Ibid*, ii, 750; (1943) *Ibid*, ii, 224.

McNee, J. W., Dunn, J. Shaw (1917) *Brit. med. J.* i, 727.

SUBCAPITAL FRACTURES OF FEMORAL NECK

FIXATION BY PIN AND GRAFT

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THE introduction of the three-flanged nail by Smith-Petersen (1931) revived great interest in the treatment of the subcapital fracture of the neck of the femur, on which little fresh work had been done since that of Whitman in the early part of this century (see Whitman 1925, 1927). As often happens with any novel departure in technique, the method of internal fixation was hailed as the panacea for all evil consequences of one of the dangerous injuries of old age; but as is also commonly the case the solution of one problem produced many others for consideration, and the answers to them should throw light on the behaviour of bone in general and joints in particular.

During the last ten years I have followed 50 of these cases under my care, commencing with the introduction of the nail by open operation, turning to the closed method with guide and X-ray control (Sven Johnsen 1932, Brittain 1936) as its advantages became apparent, and finally using the combination of pin and bone-graft to be described in this article.

HINDRANCES TO BONY UNION

In the treatment of these cases the ease of nursing produced by internal fixation of the fracture and the production of safe anæsthesia for the aged patient are the two practical points which have ranked foremost, but discussion can best be begun by considering the factors concerned in the production of bony union in a fracture of the femoral neck.

Whitman claimed 60% union by bone using external fixation of the fracture by a plaster spica. This was a tremendous step forward compared with the crippling or death which were accepted as the usual results of the injury up to his time, and his writings make it clear that he thought that adequate immobilisation of the fracture was the reason for his success. This argument was carried a step further by many of the early advocates of pinning. They held that complete fixation of the fracture would produce 100% bony union, and what more complete fixation could there be than that provided by a central nail? My own figures (63% bony union in closed nailing, see table) do not support this view, even allowing for initial failures in technique, and the aphorism "the bad results of pinning are the

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RESULTS OF CLOSED NAILING WITH AND WITHOUT BONE-GRAFT

(A) CLOSED NAILING WITHOUT GRAFT; BONY UNION IN 12 OUT OF 19				(B) CLOSED NAILING WITH GRAFT; BONY UNION IN 12 OUT OF 14			
Case	Sex and age (yr.)	Result		Case	Sex and age (yr.)	Result	
1	F 74	Pin broke out *		20	F 50	Bony union	
2	F 58	Pin broke out †		21	M 63	Bony union	
3	F 68	Pin broke out		22	F 59	Bony union	
4	M 59	Bony union		23	F 52	Bony union	
5	F 60	Pin extruded‡		24	F 65	Bony union	
6	F 81	Bony union		25	M 59	Died ¶	
7	F 69	Bony union *‡		26	F 52	Bony union	
8	M 70	Bony union		27	F 53	Bony union	
9	F 62	Bony union ‖		28	F 58	Bony union	
10	F 65	Bony union		29	M 32	Bony union	
11	F 84	Bony union		30	M 41	Bony union	
12	M 69	Bony union		31	F 60	Pin broke out**	
13	F 87	Bony union		32	M 71	Bony union	
14	M 68	Pin broke out *		33	F 74	Bony union	
15	F 65	Bony union					
16	M 67	Bony union					
17	F 65	Bony union					
18	F 76	Pin broke out					
19	F 71	Pin broke out					

Total cases, 50. The previous 17 cases were dealt with by open operation: only one of these is recorded as breaking out.

* Head necrotic in radiogram. † Pin wrongly placed.
‡ Accurate nailing. ‖ Hip ankylosed later. § Diabetic.
¶ Died in uræmic coma at 8 weeks. ** Head fragmented.

results of bad pinning" is not borne out in fact. Surgeons began to mention aseptic necrosis of the head of the femur as these cases were studied, and it became plain that the blood-supply to this part, notoriously deficient in some people, had a lot to do with union or non-union of the fracture. Also—as has been observed in the late removal of Lane's plates, with their sterile abscesses—many kinds of metal irritate human tissue, delaying union; there are a few which are inert.

The most important point has been well illustrated by the researches of Urist and Johnson (1943) into the healing of fractures in man. They have shown that in flat bony parts (e.g., trochanters of the femur) union occurs readily at a fracture by direct growth of bone across the fracture line. In tubular bony parts union is produced by the throwing across of a bridge of external callus from the parts beyond the fracture line, a much more lengthy and difficult process which depends on an adequate supply of healthy bone in the locality. This condition is often not fulfilled in the neck of the femur, which is, from the fracture point of view, a tubular bone.

BREAKING-OUT OF THE PIN

No-one who has dealt with any large number of these cases can have escaped the disappointment of seeing, during the first fortnight after fixation, the foot slowly evert and the leg adduct at the hip; while X-ray films in the same period show the pin ploughing its way upward and forward through the head of the femur into the hip-joint. The whole process is accompanied by pain, which is conspicuously absent in the normal convalescence of these patients. At first one blamed faulty technique for this—only to see, later, a nail placed dead-centre do the same thing. Then aseptic necrosis of the femoral head seemed the likely explanation, but a radiogram (fig. 1) showing the necrotic head firmly held on the pin put this out of court also (case 7 in table).

In connexion with the breaking-out of the pin two facts have impressed themselves on me as the cases have been followed. First, the broken-out pin has become more common since the method of closed insertion (using a guide and pin with a central cannula) was introduced. Out of 17 cases in which the pin was introduced by open operation only one is recorded as breaking out, although this operation was unsatisfactory from many other points of view. In 19 cases of closed nailing (see table) 7 are recorded as breaking out—at least 1 in every 3 operations.

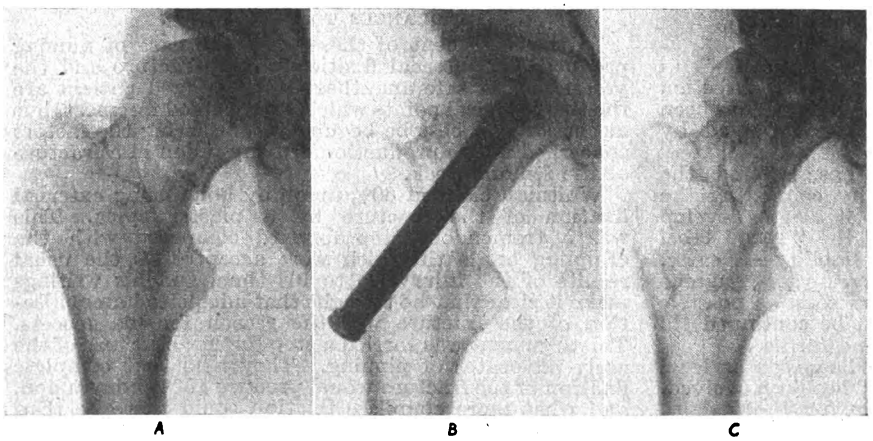
Secondly, whenever such a failure has demanded removal of the pin large quantities of joint fluid have invariably escaped from a sac around the metal head, and more fluid has flowed down the track in the bone from which the pin was removed. This is in direct contrast to the condition found when a pin is removed after, say, 2 years in a case where bony union has been established—no fluid is found there; metal fits snugly to bone and fair force is necessary for the withdrawal. There are only two ways in which such joint fluid could trickle between pin and bone: either as a result of the guide wire being pushed too far in during the early stages of the operation, thus perforating the articular cartilage of the femoral head; or through the bone surfaces at the fracture site being distracted. Both can happen easily if care is not taken, and my impression is that perforation of the articular cartilage is the commonest cause of the trouble.

ANÆSTHESIA, NURSING, AND AFTER-CARE

Whatever benefits may be derived from internal fixation of this fracture they are not worth serious consideration unless they can be applied to the aged patient, for it is here that the subcapital fracture carries its greatest risks. An anæsthetic is therefore required which is safe for old people, lasts for an hour or more, produces no shock, and leaves no serious after-effects, particularly in the chest.

The ideal agent has been found in hypobaric 'Nupercaine' (1 in 1500) with premedication by 'Omnopon' and scopolamine. The skin at the site of lumbar puncture is infiltrated with 1% 'Novocain' containing adrenaline and the nupercaine is injected while the patient lies on the sound side with the injured leg supported and the whole table in about 15° Trendelenburg position. This ensures that only the affected hip and leg are anæsthetised, that the intestinal capillary field is not paralysed, and that there is no serious drop in blood-pressure. Once the nupercaine is fixed the patient can be restored to the supine position. Between 9 and 11 c.cm. of the solution are required, according to the patient's size, and he will often go to sleep during the operation; but care must be taken not to interfere with any other part of the body than the injured leg, since anæsthesia is sharply limited. It is not claimed that this anæsthetic can be administered to any patient, but provided that the blood non-protein nitrogen is not higher than 45 mg. per 100 c.cm. and blood-pressure readings remain steady over 2–3 days with the patient at rest, it may be given with safety whatever the patient's age.

With adequate internal fixation of the fractured neck of femur the patient can sit up, move round in bed, and be free from pain and discomfort; hypostatic pneumonia and bed-sores, those twin bugbears in the nursing of old people, are therefore eliminated. What this means can best be judged by the reactions of nursing staffs who have previously had to cope with



A B C

Fig. 1—Case 7. Necrosis of the head of the femur without breaking-out of the pin. A: July, 1940, before operation. B: September, 1942, head of femur necrotic. C: October, 1942, union established, after removal of pin.

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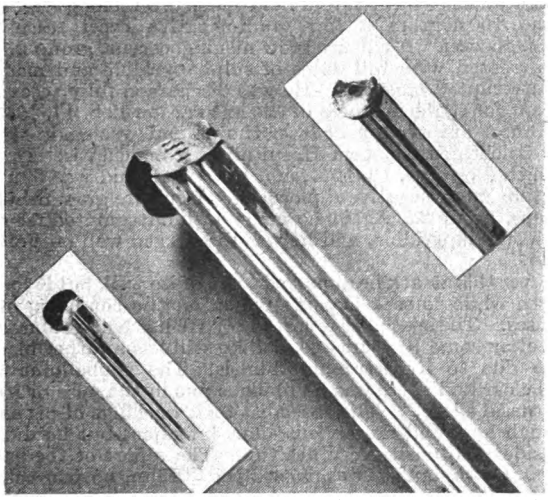

Fig. 2—Nail with segment of head ground out, used for combined pin and graft.

these people in plaster spicas or splints. In addition, incontinence, so common in the elderly, can be dealt with at a minimum of trouble. Weight-bearing should not be allowed until at least 2 months have passed without any evidence of the pin breaking out. Some surgeons prefer to wait until X-ray films show bony union.

It seems, therefore, that the indications for plain pinning of the subcapital fracture of the femur are as much general as local—in fact, in many instances the general considerations far outweigh the local ones, because protracted suffering and difficult nursing can be avoided. How, then, can an increased percentage of bony unions be combined with these general advantages?

FIXATION BY PIN AND BONE-GRAFT

The technical difficulties of fixation by combined pin and bone-graft lie in finding room for both pin and graft in the narrow neck of the femur and in making sure that the introduction of the graft does not disturb the fixation of the bone.

The patient, anæsthetised as described, is placed on a traction table, and, the fracture having been reduced, position is fixed. The head of the femur is then indicated on the surface by placing a single Michel clip ¼ in. lateral to the femoral artery in the line of Poupart's ligament, and two X-ray films, anteroposterior and lateral, are taken to check the reduction. After suitable skin preparation, operative fields at hip and shin are towelled off and the films inspected to prove reduction, particularly in the lateral view; if reduction is not complete the necessary adjustment is made now. The lateral surface of the femur is exposed at the point where trochanter curves into shaft and the cortex is broken through with a moderate-sized drill; through this aperture a single guide wire of known length is introduced. The line of entry of the guide is calculated from the position of the Michel clip, which can be seen both on the patient and in the anteroposterior film, and from the angle of anteversion of the femoral neck, which is demonstrated in the lateral radiogram. The tip of the guide should never be made to penetrate further than 3¾ in. from the outer surface of the femoral shaft, and in practice it is found that there are three common lengths of the neck of the femur, 3⅞ in. in a large man, 3⅝ in. in a small man or average sized woman, and 3⅜ in. in a small woman.

A second set of X-ray films is now taken and while they are being developed the crest of the tibia is exposed in the middle third of the bone. The films must show the guide wire centrally placed in the neck and head of the femur in both views. Any deviation must be corrected by passing a second guide. The nails used for this combined operation are of the ordinary type; a segment of the head corresponding to the gap between two flanges of the pin is ground out (fig. 2). One of suitable length is selected and tapped home along the guide; the length can be calculated accurately from the length of guide protruding from the cortex of the femur. With the nail inserted the guide is withdrawn and an ordinary ¼ in. twist drill is applied to the bony surface opposite the gap in the nail-head; with the drill bearing all the time on the groove between the nail fins, a hole is drilled across the site of fracture. Next a graft of the tibial crest, triangular in cross-section (Albee 1940) of the required length is cut and hammered into the drill-hole in the femoral neck; the disparity in cross-section ensures a firm hold. Both wounds are then closed and two final radiograms are taken for purposes of record.

It is advisable to fix the leg on a simple back-splint for some days, otherwise patients complain of pain in the shin; they never complain of pain in the hip unless the pin is going to break out. No other fixation is required, the patient is allowed to sit up as soon as he wants to, and is encouraged to move the leg from the start. Most patients have a full range of active hip movement in a fortnight. Weight-bearing is forbidden for 2 months.

The table shows the results of the method in 14 cases: bony union was achieved in 12. Figs. 3 and 4 (cases 22 and 24 in table) show the X-ray findings in two cases treated by the combined method.

CONCLUSIONS

The general indications for plain pinning of fractures of the neck of the femur far outweigh the local ones. The disasters of hypostatic pneumonia and sepsis from bed-sores are avoided, but probably no greater percentage of bony union is obtained than by fixation in a plaster spica.

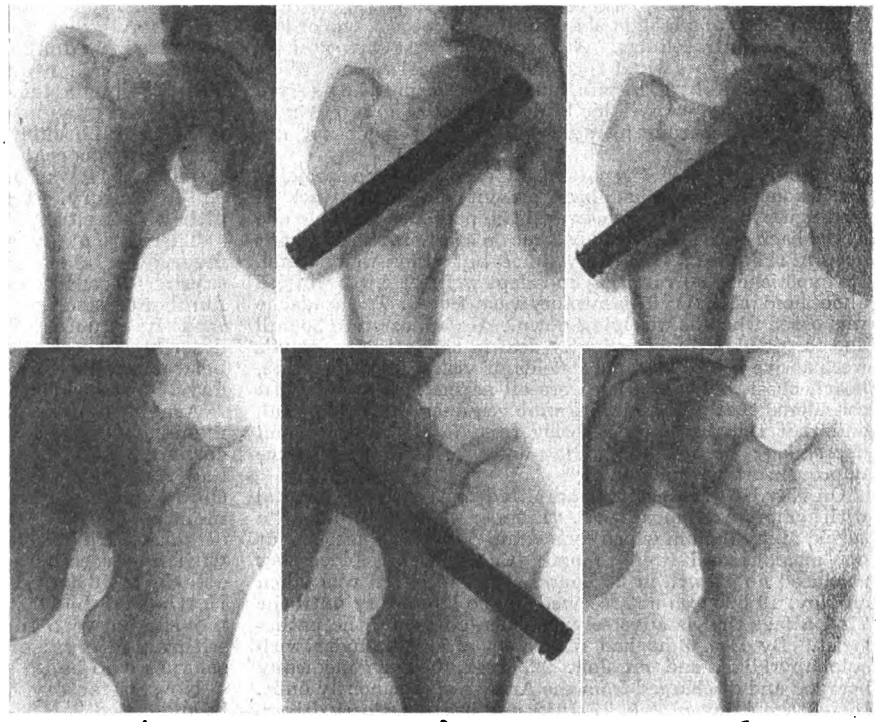

Fig. 3—Case 22. Combined operation of pin and graft. A: September, 1943, before operation. B: October, 1943. C: January, 1944.

Fig. 4—Case 24. Combined pin and graft operation. In this patient the fracture was 8 weeks old. A: May, 1942, before operation. B: December, 1942. C: September, 1943, pin removed.

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The most suitable anæsthetic for this operation is hypobaric nupercaine. It is applicable with safety even to the very aged, concentrates the anæsthesia on the area desired, and can be so handled as to avoid any serious drop in blood-pressure. Operation is contra-indicated with a blood-urea exceeding 45 mg. per 100 c.cm.

Breaking out of the nail seems to be connected with perforation of the articular cartilage of the femoral head, which allows synovial fluid to leak down the central cannula of the pin.

The results of the combined pin and bone-graft operation suggest that this method adds a greatly increased chance of bony union to the nursing advantages inherent in internal fixation. The introduction of the bone-graft adds nothing to the risk and little to the technical difficulty of nailing.

REFERENCES

Albee, F. H., Kushner, A. (1940) Bone-graft Surgery in Disease, Injury and Deformity, New York.
Brittain, H. A. (1936) *Brit. med. J.* i, 838.
Johansen, S. (1932) *Act. orthopæd. scand.* 3, 362.
Smith-Petersen, M. N., Cave, E. F., Vangorder, G. W. (1931) *Arch. Surg.* 23, 715.
Urist, M. R., Johnson, R. W. (1943) *J. Bone Jt Surg.* 25, 375.
Whitman, R. (1925) *Ann. Surg.* 81, 374. (1927) Orthopædic Surgery, Philadelphia, p. 956.

MULTIPLE ATTACKS OF CEREBROSPINAL FEVER

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IT seems probable that the man whose history is summarised below had four attacks of meningococcal meningitis and one attack of meningitis due to *N. catarrhalis*. The periods between these attacks were 2 years between the first and second attacks, 14 months between the second and third, just one year between the third and fourth, and 8 months between the fourth and fifth.

A private in the Army was admitted to a military hospital with meningitis on Nov. 9, 1939. He was sent from there to the Royal Herbert Hospital, Woolwich, and then to the Brook Hospital of the London County Council.

Purulent fluid from a lumbar puncture at the Royal Herbert Hospital showed a few organisms, in pairs, partially gram-positive and long in shape for meningococci, one or two pairs being intracellular. A flocculation test was positive with group 2 (types 2 and 4) antimeningococcal serum. While in the Royal Herbert Hospital and Brook Hospital he received full doses of sulphapyridine and 50 c.cm. of group 1 anti-meningococcal serum intramuscularly. He made an uneventful recovery.

In November, 1941, the patient was examined by a specialist for headaches which had been present since the attack of meningitis in 1939. He described the pain as a variable one at the back of the head, which came on after exertion and felt deep in the head; the eyes watered but vision was normal. He experienced no vomiting and slept well. He was worried about home affairs and his memory was affected. The headache was eased when he was lying down. He appeared to be dull and forgetful. He was slightly deaf in the left ear. Pupils were active; irises normal; fields of vision full. Reflexes, heart, chest, and abdomen were all normal. The specialist considered that the headaches were genuinely postmeningeal, and that the man was suffering from faulty memory and depression; he advised grading down to category E, since improvement was unlikely.

On Nov. 19, 1941, he was admitted to Worthing Hospital with symptoms of meningitis. Lumbar puncture produced a turbid milky fluid in which some gram-positive diplococci but no meningococci were found. Cultures on blood-agar produced no growth in 24 hours. This specimen was taken on Nov. 19 but was not received at the laboratory until the 21st, a fact that is adversely commented on by the pathologist. By Dec. 8 he had recovered, after treatment with sulphapyridine, and on Jan. 22, 1942, he was medically boarded and discharged from the Army as permanently unfit. He left the Army on Feb. 27, 1942, and became a lorry driver. He suffered from headaches at irregular intervals and these began about 3 months after each of the attacks. They were relieved by aspirin.

On Jan. 30, 1943, the man was admitted to the Colchester Isolation Hospital with meningitis. Lumbar puncture produced 20 c.cm. of turbid fluid which after a long search was found to contain a few gram-negative cocci resembling meningococci. A culture grew meningococcus, group 2. He was treated with full doses of sulphapyridine and made an uninterrupted recovery. He was discharged fully recovered, except for slight deafness in the left ear, on Feb. 17, 1943.

Almost exactly a year later the patient was again sent to the Colchester Isolation Hospital with meningitis. He was admitted on Jan. 19, 1944, and his spinal fluid was found to contain gram-negative diplococci. A culture grew meningococcus, group 2. Again he made an uninterrupted recovery with sulphapyridine, and he was discharged well on Feb. 12, 1944.

After this attack he appeared to be quite well, but it seemed worth while to seek expert opinion on the condition of his sinuses. The specialist reported: "He has had a submucous resection some 10 years ago, and he still has a rather blocked nose due to hypertrophic rhinitis. The transillumination was clear and there was no obvious pus in the nose or in the postnasal space." The specialist took washings of his antra, though he found no obvious sinus infection, but he did not consider his tonsils very healthy. The report of the pathologist on the antral washings was: "Film, no pus cells or organisms seen; culture, moderately profuse growth of pneumococcus, in almost pure culture."

Eight months later the patient came to the Colchester Isolation Hospital saying he had an attack coming on. This was on Aug. 15, 1944. He complained of severe headache and dizziness since early morning. He was admitted at once but fell down unconscious and delirious before he could be got into bed. Four c.cm. of turbid fluid from the spinal canal revealed no organisms under the microscope but a pure culture of *N. catarrhalis* was grown from this fluid. He made an uninterrupted recovery under treatment, first with sodium sulphapyridine intramuscularly and then with tablets of sulphapyridine. His recovery on this occasion was extremely rapid. He appeared to be perfectly well 3 days after his admission to hospital. While in hospital his temperature was normal during the whole period of this attack. The cerebrospinal fluid was again examined on Aug. 28, 1944. The pathologist's report read: "4 c.cm. colourless, slightly turbid fluid; 4 white cells per c.mm. (lymphocytes); protein 20 mg. per 100 ml.; culture sterile."

The patient's wife was interviewed 2 months later and reported that he was quite well, and free from headaches or deafness.

DISCUSSION

There is no doubt that this man had attacks of cerebrospinal fever due to the meningococcus in 1943 and 1944. His previous attacks in 1939 and 1941 may have been due to the pneumococcus. But it should be noted that in 1939 a flocculation-test was positive with group 2 antimeningococcal serum and that the specimen of spinal fluid in 1941 was delayed for 2 days before arriving at the laboratory. In August, 1944, his attack of meningitis was due to *N. catarrhalis*.

There are many reports of recurrences of cerebrospinal fever after short intervals, and Denis Brinton (1941) says: "Recrudesences of meningitis occurred in a small number of cases in every epidemic before chemotherapy." And he quotes Worster-Drought and Kennedy as describing a recrudescent form of the disease interspersed between apyrexial periods of not more than five or six days.

Arnold Netter (1919), when discussing late relapses in meningococcal cerebrospinal fever, quotes the case of a corporal of the 69th Regiment published by Boudin, who had four recurrences. But all were within 6 months, the longest interval between two attacks being under 3 months; in fact these were recurrences and not second attacks. He also quotes Boudin as having seen a soldier with a severe attack in 1851 who had had previous attacks in 1849 and 1850. Netter also refers to a case of North who had two attacks with an interval of 25 months between them; a case of Hermann and Kober with an interval of one year; and a case of de Warschauer who had a second attack after 5 years.

No satisfactory explanation of these second attacks is suggested. Netter says: "These relapses at short intervals have become less common thanks to the use of polyvalent sera." Whereas 20 years later Brinton says: "Recrudesences of meningitis do not happen, if sufficient doses of the sulphonamides have been given early enough and often enough."

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SUMMARY

A soldier had five separate attacks of meningitis. The meningococcus was not seen or isolated from the cerebrospinal fluid during the first two attacks, though what appeared to be gram-positive cocci (? pneumococci) were seen in the films. In the first attack a flocculation test was positive with group 2 antimeningococcal serum. In the third and fourth attacks meningococci were seen in the films and cultured. Probably the first four attacks were due to the meningococcus. The fifth attack was due to *N. catarrhalis*. The intervals between the attacks were 2 years, 14 months, 1 year, and 8 months. Pneumococci were grown from the man's antra.

Recurrences of cerebrospinal fever after short periods have been recorded, but there are few published examples of true second attacks.

REFERENCES

Brinton, D. (1941) Cerebrospinal Fever, London.
Netter, A. (1919) *Arch. Méd. Enf.* **22**, p. 72.

MIKULICZ PACK USED IN A THORACIC WOUND

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MAJOR RAMC

FROM time to time cases are seen at forward operating centres where speed in surgery is a decisive factor. The closure of a wound in the chest or abdomen by ordinary methods may be incompatible with the survival of the patient. In several desperate cases I have attempted to close large gaps in the parietes by means of a Mikulicz pack. I am reporting here a successful example of the use of such a pack as a temporary method of treating an enormous wound of the right thoracic cavity.

The method was originally suggested to me by A. K. Henry, who has discussed recently (LANCET, 1944, ii. 816) how the Mikulicz pack can be employed in non-tuberculous empyema. The principles involved are in some ways different from those in wound surgery, but Henry's paper should be consulted for his account of the history of the method and references to its previous use in thoracic surgery.

CASE-HISTORY

A signalman, aged 31, was wounded at 1 PM on Nov. 5, 1944, by a high-explosive shell. He was admitted to the forward operating centre at 1.15 PM, when he was pale, cold, and distressed, with pulse-rate 120 per min. and BP 80/50 mm. Hg. A sucking wound of the right chest was temporarily controlled with a 'Vaseline' gauze pack. There was a large right hæmothorax. A blood drip was started and his colour improved slowly, though he remained severely dyspnœic. His pulse-rate increased to 150 and after several hours his blood-pressure began to fall. He was taken to the theatre after receiving four pints of blood on the presumption of continued severe intrathoracic hæmorrhage. He was then unable either to lie down or move.

First operation.—At 9.30 PM on Nov. 5 he was anæsthetised by Captain Rodger, receiving 'Pentothal' 0·25 g., nitrous oxide, oxygen, and a trace of ether, and an intercostal block with 40 c.cm. of 1% 'Nuvutox.' Large sucking entry and exit wounds of the right lower chest were joined by an incision through skin and muscle, to reveal a completely shattered segment of chest wall 7 in. × 2 in. with numerous comminuted rib fractures. The chest was full of blood. The lower lobe of the right lung was black and solid. There was a hole in the diaphragm 4 in. × 2 in. with a bleeding tear of the upper surface of the liver. It was considered that the patient would not survive any attempt at suture of the gap and that strapping over dressings would allow intrathoracic and probably intra-abdominal bleeding to continue. The liver was therefore packed through the diaphragmatic tear so as to prevent bleeding into the peritoneum. A self-retaining catheter was placed in the posterior end of the wound. A large jaconet towel was inserted into the wound and packed on the inside with rolls of gauze so as to exert even pressure on the wound margins and on the raw surface of the liver. Three sutures between the skin margins helped to fix this pack and the whole was strapped firmly in position with 'Elastoplast.' The operating time was less than 20 minutes. Respiratory embarrassment disappeared with closure of the chest. The man's general condition at the end of the operation was improved, though his pulse-rate remained at 150 per min.

Postoperative treatment: concentrated plasma 1 pint, followed by glucose-saline; penicillin 15,000 units intramuscularly 3-hourly; sulphadiazine 3 g. 12-hourly into drip until conscious; oxygen from BLB mask; catheter on constant suction. The penicillin dosage was continued until Nov. 15. On Nov. 6 he was started on sulphathiazole 1 g. 4-hourly.

Nov. 7: General condition improved. T 98°F, P 130, R 30. Dullness at right base; breath sounds absent; apex beat in 5th space 2 in. outside midclavicular line. Urinary difficulty; catheterised.

Nov. 8: Urine contained albumin and sulphathiazole crystals. Sulphathiazole discontinued.

Nov. 10: General condition excellent.

Second operation.—Under intratracheal nitrous oxide, oxygen, and ether the dressings and pack were removed. A moderate amount of necrotic muscle was excised, the broken ends of five ribs resected, and the diaphragm sutured. A rubber drain and a gauze pack were brought out from the liver area below the diaphragm through a stab wound. A large intercostal catheter was inserted above the posterior end of the wound. The wound was closed by suture of the divided overlying muscle to the remains of the intercostal tissues. The thoracic cavity was thereby made airtight.

Postoperative treatment: concentrated plasma 1 pint, glucose-saline 2 pints, anti-gas-gangrene serum 33,000 units intramuscularly for 3 days; constant suction on catheter, and penicillin 60,000 units given slowly through tube. (Suction was stopped for an hour after insertion of each dose of penicillin.)

Nov. 11: General condition excellent; pleural drainage produced 1 pint bloodstained fluid.

Nov. 12: Red cells 2,700,000 per c.mm. Given blood 1 pint.

Nov. 15: Re-dressed; liver pack partially withdrawn.

Nov. 16 and 17: General condition excellent; some serous oozing from wound. White cells 16,000 per c.mm. X ray shows almost complete expansion of right base with very small quantity of fluid.

Nov. 18: Re-dressed in theatre. Intercostal catheter removed. Muscle suture line had broken down leaving a single local cavity completely shut off from the pleura. Rubber drain in lower stab wound. Penicillin started again, 15,000 units being again given intramuscularly 3-hourly.

Patient was evacuated 4 days later in good condition. Transferred to base thoracic centre. A subsequent report said that his wound had been sutured (*third operation*) and was almost healed, and that he was up and about on Dec. 24.

COMMENT

It is to be noted that the Mikulicz pack was used in the first operation to close the thoracic cavity and to check bleeding in the thoracic wall. I am convinced that this patient's life was saved by the use of this simple and speedy measure. It was clear at the second operation that at least 30 minutes was necessary for even minimal excision and closure by suture.

The second operation (excision and suture after multiple rib-resections), while not resulting in primary union, enabled the lung to be re-expanded. This was facilitated by the use of constant suction, using the three-bottle method already in routine use for gastric suction.

Penicillin and sulphathiazole were used together until renal irritation was suspected. No special claim is made for the combination, but I should have been much less happy performing the subsequent operation for closure without penicillin.

SUMMARY

A man with a large right-sided injury to the thoracic wall, with damage to lung and liver, was in a desperate condition at time of his original operation. Closure of the cavity and hæmostasis were secured by using a Mikulicz pack. The method may be useful in other desperate cases with large parietal defects of thoracic or abdominal walls.

My thanks are due to Captain R. A. Moir, the physician responsible for detail of aftercare, and to Prof. A. K. Henry for reading the proofs.

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Reviews of Books

Exercises in Human Physiology

Sir THOMAS LEWIS, CBE, MD, FRS, FRCP, physician in charge of department of clinical research, University College Hospital, London. (Macmillan. Pp. 103. 3s. 6d.)

THIS book gives more than it professes, and every medical student should buy it. Thirty-three sets of short exercises are prescribed, mostly on the cardiovascular and "cutaneous" systems of man. Apart from their intrinsic value they are worth reading for the characteristic clarity of the instructions and the simplicity and significance of the deductions which are drawn. Sir Thomas Lewis felt that the transition from preclinical to clinical studies was the most difficult period for the medical student, and the book is a contribution to "human" physiology which he regarded as the best bridge. In many physiological laboratories most of the experiments are now made directly or indirectly upon the human subject, and it is questionable whether this kind of work should be postponed to the end of the preclinical course. All the while he is studying anatomy, physiology, and biochemistry the student must be saturated with those ideas in terms of which he will think for the rest of his life. It is itself a sustained period of transition, and it carries two dangers: first, that he will not acquire sufficient knowledge and sufficient ease in handling it; and secondly, that in the strain of dealing with so much that is unfamiliar he will lose his common-sense. The exercises provided in this small book are a valuable safeguard against the latter catastrophe. Many of them are observational and furnish not only an introduction to clinical methods, but a demonstration that in spite of the elaborate nature of much physiological apparatus, the ordinary everyday methods of reasoning from direct observation are not only possible but necessary and important—the fundamental basis, in fact, of experimental work of every kind. It is as essential for the student to keep his feet on the ground during his preclinical course as to find his feet afterwards, and by fulfilling the first requirement he may make the second very much easier.

Traumatic Injuries of the Facial Bones

J. B. ERICH, MS, DDS, consultant in laryngology, oral and plastic surgery, Mayo Clinic; L. J. AUSTIN, DDS, FACD, head of the section of dental surgery at the clinic. (Saunders. Pp. 600. 36s.)

THE authors have produced a good atlas of treatment for the simple injuries of the facial bones, though they are less successful in their account of serious conditions. Each type of injury is illustrated by plaster models, and a brief summary describes a method of treatment for each. The need for removal of teeth in the fracture line is emphasised, and the few occasions in which such teeth may be left are thoroughly impressed upon the reader. They also stress the importance of an adequate plan of therapy, but they are on less sure ground in advising that, in serious cases, the soft-tissue injury should receive immediate treatment and the bony injury be left until a later date: experience with battle casualties has shown us that the early and accurate reduction of the bony framework must be regarded as basic in this type of surgery. Moreover, they might explain how, after sawing through a plaster model at the site of fracture, they are able to mount these fragments in proper alignment to each other and to the upper plaster model, in order to construct their acrylic splint. The technical difficulties of such a procedure are very great. The method of treatment described for backward displacement of middle-third fractures is elaborate and uncertain, and the treatment suggested for comminuted mandibular fractures, and the preparation for bone-grafting, are scarcely in line with modern thought. Our own war experience has taught us that a traction device attached to a plaster head cast is useless in the treatment of depressed pyramidal fractures of the maxilla, and that complicated intra- and extra-nasal devices attached to a plaster head cast, to maintain reduction of facial fractures, are to be condemned.

All the injuries are beautifully illustrated and described, but it seems that the authors had had little or no war experience when the book was written. It is a safe guide only to the treatment of simple fractures.

Medical Societies

SOCIETY OF MEDICAL OFFICERS OF HEALTH

AT a meeting of the fever group on March 9, with Dr. M. MITMAN, the president, in the chair, a discussion on the

Epidemiology and Treatment of Some Eye Infections

was opened by Prof. ARNOLD SORSBY. Provisional analysis of 9622 blind certificates in the counties of London and Middlesex area shows, he said, that 1427 persons (or 15%) were blinded by infectious disease. In about two-thirds of this 15%, ophthalmia neonatorum and syphilis were responsible, ophthalmia neonatorum being the cause in 265 cases, congenital syphilis in 516, and acquired syphilis in 290. The remaining third is chiefly contributed by trachoma (134) and the various specific fevers (103). The low incidence of infectious disease amongst the causes of blindness in England and Wales is in striking contrast to that found in countries like Egypt, and the Middle East generally, where over 80% of all blindness is caused by infections—mainly the acute ophthalmias, and to a lesser extent trachoma. Infection was formerly the major cause of blindness in England also; at the beginning of the last century smallpox was the largest single factor, and towards the end of the century ophthalmia neonatorum. Even as late as 1922 some 30% of all children at blind schools had been blinded by ophthalmia neonatorum; but by 1942 the incidence had declined to about 10%. The emphasis has shifted from infection to other factors—genetic anomalies in the young and degenerative lesions in the elderly.

Though the eradication of blindness due to infectious disease appears likely within measurable time, there is still much eye disease from these causes. It is disquieting that, though the incidence of blindness from ophthalmia neonatorum has reached vanishing-point, there is no evidence that ophthalmia neonatorum itself has declined considerably. A clearer appreciation of its ætiology is needed, especially as it is now established that only some 20–25% is gonococcal, and that at least 10% is due to virus infection. While congenital syphilis has also declined to a gratifying extent, other transmitted maternal infections—such as toxoplasmic choroido-retinitis—are only now being recognised. The decline in the incidence of trachoma in childhood has brought out the fact that there is still a residue of trachoma in adults, which is a possible source of epidemic outbreaks. Intensive application of the modern procedures for the study of virus diseases is urgently needed in ophthalmology.

The sulphonamides and penicillin are proving an immense help in the treatment and elimination of infectious eye disease. In ophthalmia neonatorum oral administration of the sulphonamides and local application of penicillin easily control this otherwise serious affection. The acute ophthalmias of tropical and subtropical countries likewise respond well to the sulphonamides. In trachoma local application of the sulphonamides has made the classical remedies obsolete. These new methods of treatment are, however, likely to be effective only in the bacterial infections of the outer eye. Intraocular inflammation is rarely bacterial, and such common conditions as iritis and choroiditis still need intensive study.

In reply to questions Professor Sorsby said it was doubtful whether the routine prophylactic use of silver had done much to reduce the incidence of ophthalmia neonatorum, nor did he think the sulphonamides likely to do so. Routine instillation of penicillin eye-drops at birth deserved extended trial when supplies permitted. The placenta was a powerful barrier to the transmission of intra-uterine infections and it remained uncertain which organisms could pass; much of what had been called intra-uterine inflammation was really genetic disease. There was nevertheless a considerable field for study of such infections.

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THE LANCET

LONDON: SATURDAY, MARCH 31, 1945

The Negotiators Report

FROM the beginning of this year a Negotiating Committee representing the British Medical Association, the Royal Colleges, and other professional bodies has been meeting the Minister of Health and the Secretary of State for Scotland to discuss the Government's proposals for a National Health Service. The committee has now produced a report, which was discussed by the BMA council on March 21, and by the comitia of the Royal College of Physicians of London last Monday, and will be considered by the council of the Royal College of Surgeons of England at its next meeting on April 12. The BMA council will place the report, with their own recommendations, before a special representative meeting to be held in London from Thursday, May 3 onwards. The report itself is a confidential document in that it cannot be published. But the Association has arranged to post a copy to every member of the profession, and these are likely to be delivered over Easter.

Globulin in the Control of Measles

THE physicochemical researches on human plasma carried out by Professor COHN and his colleagues[1] at Harvard have culminated in discoveries of immediate practical application in medicine, and one of the protein fractions he has isolated in almost pure form—gamma globulin—is likely to prove of great value in the control of measles. Globulin, which comprises 38% of the total plasma protein, was found to be divisible into three sharply demarcated fractions—alpha globulin (13% of all plasma protein), beta globulin (14%), and gamma globulin (11%), originally called Cohn's fraction II, which appears to contain the main immune bodies in human blood. The latest preparations of gamma globulin have been concentrated to a degree approaching 98%, the main impurities being albumin and beta globulin; the final product represents a 25-fold concentration of the original plasma. Suitably buffered and stabilised this preparation can, without significant change, be heated at 57° C for 4 hours, whereby the agent of infective jaundice is destroyed. Although the solution is somewhat viscous and unsafe for intravenous administration, it is readily absorbed from muscle without untoward effect, local reactions being fewer than 5%. Its application in the prophylaxis and treatment of measles has lately been described in detail.[2]

Many of the inoculations for measles were made during the early experimental stages, when gamma globulin concentrations ranged from 75 to 85%; so there were considerable variations in dosage and therefore in the results obtained. But the latest preparations have proved to be more than twice as potent, volume for volume, as average pooled convalescent serum. The difficulties of assessing the efficacy of the prophylactic in humans, owing to the widely varying degrees of exposure and susceptibility of contacts, were largely overcome by large-scale trials in families, in schools, and in hospital wards. The optimum dosage finally arrived at was: for protection, 0·1 c.cm. per lb. body-weight given between the 3rd and 5th day after earliest known exposure, while for attenuation a quarter of that amount was considered adequate; proportionately larger doses were needed if inoculations were given later in the incubation period, and results then tended to be less constant. The attenuating dose appears to have been on the small side, compared with the protective dose, and indeed some of the descriptions given of successful attenuation approximate to what is usually regarded as normal mild measles in healthy subjects. Extensive experience of convalescent serum in this country, particularly in London,[3] has for many years fixed the optimal attenuating dose as half the protecting dose. In a more recent study, GREENBERG, FRANT, and RUBSTEIN[4] compared gamma globulin with placental extract; a fixed dosage of 2 c.cm. of the former and 5 c.cm. of the latter was adhered to regardless of age, given to household contacts aged 6 months to 6 years, between the 3rd and 8th day of exposure. The results clearly showed the superiority of gamma globulin, which gave 78·7% protected, 21·3% modified, and none unmodified; compared with 38·9% protected, 37·7% modified, and 23·3% unmodified with placental extract. In a control (uninoculated) group of 65 contacts of similar age 83% developed measles; 31% being severe, 12 moderate, and 10 mild (corresponding in character of attack to the serum-modified cases). The results in the 814 cases receiving globulin were examined at each age-group and they became steadily less favourable both in protection and attenuation as age increased. Adjustment of the dosage to the age or body-weight is particularly necessary in rural communities where chances of exposure and partial immunisation are remote; in urban communities results of serum prophylaxis always tend to be flattered by the fact that a significant proportion of the presumed susceptibles have already been partially or completely immunised by latent or unrecognised attack. The globulin was used in doses of 5 to 35 c.cm. in the treatment of fully developed measles in 30 patients whose ages ranged from 10 months to 34 years; in 13 some modification of the disease was recorded, based solely on clinical impressions. In a further 31 patients in the pre-eruptive stage, modification was observed in 24, while no rash ensued in 2, although Koplik spots and other features put the diagnosis beyond doubt. It is understood that gamma globulin, supplied through Professor COHN and the Committee on Medical Research, has already been used for measles prophylaxis in this country. Preliminary trials have largely confirmed the claims made for it, but dosage is not yet finally settled.

To what extent this new reagent will displace those widely used in the last two decades—convalescent and normal adult serum, and placental extract—is uncertain. It apparently obviates such risks as the homologous serum jaundice recorded with convalescent and adult serums, and indeed it has

1. Cohn, E. J. *Chem. Rev.* 1941, **28**, 395.
2. Cohn, E. J. et al. *J. clin. Invest.* 1944, **23**, 417.
3. Gunn, W. Reports on Measles Epidemics by Medical Officer of Health, London County Council, for 1931–32, 1933–34, 1935–36, London.
4. Greenberg, M., Frant, S., Rubstein, D. D. *J. Amer. med. Ass.* 1944, **126**, 944.

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been used to prevent infectious jaundice in contacts.[5] It is probably also more stable, but nowadays desiccation of convalescent serum to powder form has overcome this particular difficulty. It is, moreover, seldom the cause of such reactions as are not uncommon with placental extract, from which a fatality has recently been reported.[6] But perhaps its greatest merit will be its increased range of application: provided it is prepared from sufficiently large pools the globulin is likely to contain protective antibodies to a number of communicable diseases such as whooping-cough, chickenpox, mumps, and poliomyelitis. But it is unlikely to influence significantly the character or course of epidemics unless a stable preparation of uniform potency is available in sufficient quantities to permit us to expose susceptibles deliberately to a particular infection in order to confer on them the lasting benefit of a modified attack; convalescent serums have been too uncertain to warrant this crucial test. In combination with active immunisation methods involving the use of attenuated virus[7] the hitherto constant menace of measles to the young should be reduced considerably if not eliminated.

Resettlement

IN our industrial society doctors are encouraged to prescribe appropriate drugs but are seldom enabled to prescribe appropriate work—which is often far more important. During the war the medical profession has won a better foothold in industry, through the development of industrial medical services; but, on the other hand, the demands of war have been held to justify employment of many people in work that may harm their health. When the war is over we must hope that medicine will do more to prevent people undertaking work for which they are unfit, and also more to find them the right occupation.

To find the right occupation for a patient left with residual disability after illness or injury is often extremely difficult. The work should be such as will fully utilise his remaining abilities, after any further training that may be necessary: and he must have a real opportunity to succeed in it. The Disabled Persons (Employment) Act, 1944, has been designed to help in providing work—and the right work. Among other things the Act will create a Register of Disabled Persons and will impose on each employer an obligation to carry a (variable) quota of disabled staff. It defines a disabled person as one who, on account of injury, disease, or congenital deformity, is substantially handicapped in obtaining or keeping employment, or in undertaking on his own account work of a kind which, apart from his handicap, would be suited to his age, experience, and qualifications. It is intended to confine the register to those likely to be capable of holding a job, and the disabled man must not unreasonably refuse to attend a course of vocational training or reablement, nor be of habitual bad character. Shortly before the Bill became an Act we expressed misgivings about the register and the quota, fearing lest "both employer and disabled will become 'cripple-minded'—the employer because he is forced to take labour which through ignorance he instinctively distrusts, and the employee because he knows he is a marked man, distrusted and resented by his employer."[1] We thought the emphasis should have been put on the ability of almost every disabled man to earn his living in the open labour market. The Act moreover permits an employer, following the letter but ignoring the spirit, to make up his quota entirely from the lightly disabled; and it is said that some are planning to get as many as possible of their present employees on to the register so that they will need to take no others. Such evasion of social responsibility must be resisted, and—whether or not the scheme is the best possible—all parties must unite to make it work. The appeal is not so much to sentiment as to economic sense. The potential value of the disabled to the community is illustrated by the latest figures from the United States where some 44,000 men and women were returned to employment last year by the Office of Vocational Rehabilitation. Their average earnings in the previous year had been $143, but after an expenditure of $147 on reabling them it rose at once to more than $1700.

Under the Act central and local advisory committees (with medical representation) will be set up to help the Minister of Labour and National Service in its administration. The question will arise, for instance, whether a person is suitable for admission to the register or should be removed from it, and the rightness of decisions will be important not only from the individual standpoint but in order to make the quota serve its purpose. What is most necessary, however, to make the scheme effective is genuine coöperation by the many people involved—the disabled man himself, the employers, the medical profession, and the Ministry of Labour and National Service. On another page Mr. WATSON-JONES urges the need for medicine to play its part. But if doctors have as a whole to take more interest in industrial health, the Ministry on its side must appreciate that medicine has a contribution to make in these matters, and must be willing to act on medical advice. To make the best use of the profession, family doctors must be given an opportunity to help in the resettlement of their disabled patients in work; and further there must be available to the Ministry and to general practitioners and hospital staffs the services of medical experts with real and substantial experience of industrial health—men thoroughly familiar with industrial stresses and the demands of particular occupations. As Professor FERGUSON points out at the front of this issue, only catastrophe can come of leaving the placement of the disabled to the unaided efforts of a local lay officer of the Ministry of Labour, even though he is armed with a medical dictionary and a list of occupations thought to be suited to particular disabilities.

Resettlement of the disabled essentially demands balanced consideration and expert help. It demands an individual approach and usually a measure of continuing supervision until the disabled man is securely lodged on work within his compass. Undertaken along these lines, and in a spirit of sympathetic understanding, it has great possibilities; and we must gain as much as we can from the Act. One of the objects of the new British Council of Rehabilitation, as announced in our issue of March 3, is "to secure the

5. Stokes, J., Neefe, J. R. *Ibid*, 1945, **127**, 144.
6. *Ibid* (answers to queries), 1944, **124**, 472.
7. *Lancet*, 1944, i, 728.

1. *Lancet*, 1943, ii, 771.

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active coöperation and participation of commerce, industry, and professional bodies in the problems of resettlement," and in Mr. H. E. GRIFFITHS, chairman of its executive, the Council has a leader who has long preached that, for the worker, the criterion of recovery is restoration of capacity to *work*.

Orthoptics in Peace and War

Since CLAUD WORTH taught the three degrees of binocular vision and the use of the stereoscope, interest in squint training has grown apace. The British Orthoptic Society was formed in 1937, and some years before the war all the leading eye hospitals, and many general hospitals as well, had started orthoptic clinics. At these clinics qualified orthoptists worked under the guidance of ophthalmic surgeons, and endeavoured to teach squinting children to develop binocular vision. Sometimes also the latent squints of adults received attention, though they were less likely to benefit. It may be appropriate now to inquire into the results of orthoptic treatment and to ascertain what exactly can be done for the squinting child by this means.

Before the age of five, children do not coöperate well enough to allow of any squint training. Until they reach this age it is the duty of the ophthalmic surgeon to see that correct glasses are worn, and that by wise occlusion of the sound eye the squinting eye is not allowed to become amblyopic. When the child is old enough to coöperate, simple exercises can begin, and the whole purpose of these is to teach the child to use the two eyes together by fusing pictures seen through the stereoscope. If the squint is transitory or very slight it is sometimes possible, when fusion has been taught, to train the eyes to the normal position, but in the great majority an operation is necessary: orthoptics by themselves are not a cure. Having taught the child to look down a stereoscope and fuse two pictures into one at the angle of squint, the eyes are then straightened by a muscle operation and the treatment is continued, with the final result of two straight eyes which work in unison. Eyes so treated will not again wander, and the patient has all the advantages that stereoscopic vision offers. This is the cure of a squinting eye, and it is achieved not by orthoptics alone or by operation alone, but by the two together. Orthoptic training is a great advance, for it leaves the patient with two straight and seeing eyes instead of with two eyes which, although straight, do not work together, and of which one is lazy. To achieve this end, however, a great deal of time and patience is necessary, not least on the part of the parents. Since the war it has often been inconvenient to bring children into London or large urban areas two or three times a week for this treatment to be carried out; but a great deal can be done in the home with hired apparatus, if the parents will give patient supervision.

Since the war a number of orthoptists have been employed in the Royal Air Force in treating flying personnel. At the outset much time was spent in developing a high degree of binocular vision in those who lacked it, in order that they might become pilots, but latterly this treatment has been less in evidence. If a would-be pilot is unable to fly without orthoptic exercises it is probable that when the stress and strain of aerial warfare begins to find out his weaknesses his binocular vision will break down again. There is an ample supply of potential pilots with good binocular vision, and while this is so it is better to make use of them than to spend time in giving others training, which may in the end prove to be wasted. Service orthoptists, nevertheless, have been very useful in rehabilitating the eyes of sick or injured airmen. Illness causes loss of the muscle tone on which perfect coöperation of the two eyes depends, and every convalescent reading in bed after a long illness knows what difficulties loss of ocular muscle tone entails. Head injuries especially are liable to upset binocular balance, and much good work has been done in restoring ocular muscle tone to those who have lost it for one or other of these reasons.

It is interesting to note that the permissible limits of heterophoria in the RAF are being gradually extended, and perhaps we shall find that orthophoric vision is not quite so important in the landing of aircraft as was at first thought. The first number of the *British Orthoptic Journal* was published just before the war and the second has lately appeared. Reading through its pages of tables and degrees of this and that one feels that there is a danger that those who practise orthoptics are relying too much on the readings of their machines and not allowing enough for the human element. It is refreshing to read Squadron-Leader DOGGART'S reminder[1] that while such symptoms as headache, transient blurring of vision, intolerance to light, and pain on moving the eyes, may be due to ocular abnormalities, they are also the stock-in-trade of the anxious neurotic.

Annotations

ÆTIOLOGY OF GRANULOMA VENEREUM

THE venereal disease known here as granuloma venereum and in America as granuloma inguinale has long been recognised on clinical and pathological grounds as a distinct entity. It is essentially a disease of tropical climates, including India and the Southern USA, and its ulcerative lesions in groins and on the genitalia have earned it an unpleasant reputation. Though Donovan[2] discovered characteristic intracellular bodies in the lesions as long ago as 1905, and the association of these bodies with the disease has been amply confirmed, no organism recoverable by cultural methods has yet been accepted as the causal agent. A new chapter in the story opened with the employment by Anderson[3] of the yolk-sac of developing chick embryos as a culture medium for tissue fragments from biopsy specimens of the ulcers of a typical case. Further reports[4] from the same laboratory seem to establish the organism thus recovered on a firm ætiological basis. This organism, for which the name *Donovania granulomatis* is tentatively proposed, has now been recovered from three cases by the inoculation of biopsy material into the yolk-sac of chick embryos 5–9 days old. It grows intracellularly in the epithelial cells of the yolk-sac in the form of bipolar rods with well-defined capsule, indistinguishable from the Donovan bodies of the human lesion. Extracellular and also unencapsulated forms are seen and the latter assume variable appearances with bipolar and "safety-pin" forms. Studies of the nutritional requirements of this organism indicate its dependence on a relatively thermostable component derived from living cells, for the yolk of infertile hen's eggs will not support its growth. Transfer from yolk-sac cultures of developing eggs to yolk

1. Doggart, J. H. *Brit. Orthoptic J.* 1944, no. 2, p. 49.
2. Donovan, C. *Ind. med. Gaz.* 1905, **40**, 411.
3. Anderson, K. *Science*, 1943, **97**, 560.
4. Anderson, K., De Monbreun, W. A., Goodpasture, E. W. *J. exp. Med.* 1945, **81**, 25.

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from embryonated eggs to which chick heart tissue is added enables growth to be obtained ultimately on agar slants down which embryonic yolk only is run. Embryonic yolk heated to 60° C for 30 minutes also supports growth, but heat-coagulated yolk is an inadequate medium. The failure to recover this fastidious organism by direct cultivation of human lesions on orthodox media is thus fully explained.

To confirm the suggested relationship of this new organism to the disease, Anderson and her co-workers carried out immunological studies.[5] Yolk cultures contained a mucoid substance thought to be derived from the capsules of the organism. This material could be purified and used in precipitin and complement-fixation reactions. Sera from cases of granuloma inguinale reacted with the mucoid antigen, whereas control sera failed to fix complement and only rarely gave precipitation. In addition to these in-vitro studies, skin tests carried out either with heated purified yolk-sac cultures or with purified capsular material indicated a specific reaction in patients with the disease but not in control subjects.

This study has an interest far beyond immediate ætiological considerations. The Donovan organism, though considered by the American workers to be a bacterium, appears to possess unusual growth requirements. Elucidation of the nature of the relatively heat-stable growth factors of the new organism may well have a bearing on the growth of other intracellular parasites, including perhaps the rickettsias. It seems fitting that this new venture should originate from workers in the laboratory which first employed that most useful culture medium, the developing hen's egg, in virus and bacterial studies.[6] They are now making chemotherapeutic studies in the test-tube with antimony compounds—a logical sequel to the known action of such compounds on human granuloma inguinale. Others will doubtless attempt the direct cultivation of the organism from the human lesions; the main difficulty appears to lie in separating it from the common bacteria of the human skin. The American workers avoided contamination by several methods, including utilisation of the Donovan organism's capacity for survival on ordinary media at 37° C for 2–4 days; uncontaminated tissue fragments can thus be readily distinguished and transferred from culture media to the chick embryo. The fact that the human disease is resistant to penicillin therapy[7] suggests that penicillin might be usefully employed in this difficult stage of initial recovery of the organism, unless it exhibits an unexpected in-vitro sensitivity to the drug.

MORE PENICILLIN

THERE will soon be enough penicillin in the country to treat every hospital patient suffering from any disease known to respond better to penicillin than other drugs. The biggest penicillin plant in the world, working on the American principle of deep fermentation, is now being erected at Speke, near Liverpool, and the Ministry of Health is shortly distributing supplies to 200 large hospitals, which will issue it to smaller hospitals and practitioners. Forecasts that in 2–3 months it will be on sale in chemists' shops have lately appeared, but the Ministry does not foresee early distribution through ordinary commercial channels. The period of short supplies, though it has produced hardship in individual cases and irritation among practitioners, has had the salutary effect of limiting penicillin therapy to hospitals where its administration can be carefully controlled and results fairly judged. In the United States penicillin has hitherto been distributed by a centre set up by the War Production Board in Chicago, and the centre has been sending out about 400,000 vials, each containing 100,000 units, every month to some 2700 hospitals. Now American producers may sell the drug through the wholesale chemists, and the monthly supply will be raised to 1,500,000 vials. Even so, there will not be enough to permit the general sale of pills, lozenges, ointments, and the like, containing penicillin. The Americans, like ourselves, must be hoping that the relaxation of control in distribution will not lead to uncontrolled medication. However plentiful supplies become, penicillin should be used in practice only for infections known to respond to it, and wherever possible the infecting bacteria should previously be tested for sensitivity. Exceptions to this last requirement are the prophylactic use of the drug before and after operation, illnesses that are clinically septicæmic where an infecting organism has not yet been isolated, and acute streptococcal and pneumococcal infections not responding to sulphonamides.

5. Anderson, K., Goodpasture, E. W., De Monbreun, W. A. *Ibid*, p. 41.
6. Nelson, R. A. *Amer. J. Syph.* 1944, **28**, 611.
7. Woodruff, A. M., Goodpasture, E. W. *Amer. J. Path.* 1931, **7**, 209.

UPPER RESPIRATORY CLINIC FOR CHILDREN

DISSATISFIED with the criteria for the removal of tonsils and adenoids in children and the investigation of their recurrent respiratory infections as a whole, the staff of the ear, nose and throat department of Willesden General Hospital decided to form a special clinic to go into these subjects. The child is an entirely different problem from the adult. In the child it should be possible to correct disability while it is in the stage of dysfunction and before it has reached an established pathological state. It was hard to keep this point of view when seeing children mixed up in a general clinic, and an ear, nose and throat clinic for children only was therefore started. In opening a discussion at the Royal Society of Medicine on March 2, Mr. F. C. W. Capps and his colleagues[1] explained that the clinic aimed at encouraging repeated attendances so as to avoid a quick decision at a single isolated consultation, to record progress, and to maintain a state of environmental defence. A scheme of investigation, starting with an assessment of social conditions and environment by the social welfare department, followed by clinical examination, radiography of the accessory sinuses, soft-tissue radiography to exclude an obstructive pad of adenoids, and screening of the chest, was laid down. Ideally the upper and lower respiratory tracts should be considered as a whole, and to this end it was intended to have a pædiatrician associated with and probably controlling the activities of the clinic. Owing to war-time shortage of staff this has not been possible, and a rhinologist with past experience of general medicine has been in control. Special attention has been paid to the evolution of the mouth breather, particularly those in whom operations for the removal of enlarged tonsils and adenoids has been a total or partial therapeutic failure. Normal nasal respiration depends on the efficiency of a series of muscle-group activities, starting with the maintenance of facial symmetry and dilatation of nasal alæ, followed by closure of the isthmus of the fauces by interaction of the tongue and palatal musculature, and finally recurrent and rhythmical deglutition to remove secretion and debris from the postnasal space. It was realised that such musculature must have a properly orientated scaffolding on and from which to work. This postulated a normal craniomandibular relationship, and to assess this factor an orthodontist was included in the team. The functional evaluation of coördination and control of the palatolingual and respiratory musculature was deputed to the speech therapist.

The aim throughout has been to restore conditions for a normal respiratory exchange and deglutition by reconstituting a normal bony structure of the jaws; removing obstructive or diseased lymphoid tissue which will not

1. Mr. E. Gwynne-Evans, Mr. Arnold Nove, and Miss J. H. Van Thal.

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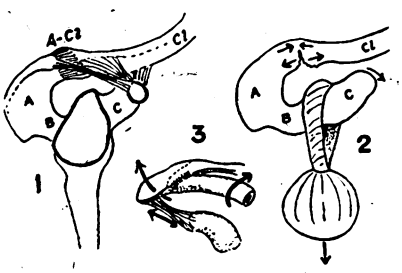
respond to environmental and conservative therapeusis; clearing occluded areas in the nose and accessory sinuses by conservative measures where possible but by lavage or even operation in persistent occlusion or chronic infection; and finally restoring the activities and tone of the various muscle-groups concerned. At the same time the child's general health and posture have been under constant supervision.

The team has so far consisted of social worker, rhinologist, orthodontist, and speech therapist, and close coöperation has been demanded from the radiological department. There is scope for much more social welfare investigation than has been possible in war years and the incorporation of a pædiatrician is an urgent requirement. Without him the assessment of the lower respiratory factors is necessarily incomplete. The virtue of the team is their presence together at the clinic and the facility thus afforded for immediate consultation on any aspect of each case. Starting at the end of 1942 there have during 1943 and 1944 been 1000 new cases and some 4500 attendances for following progress. During 1943 operations for removal of tonsil and adenoids were performed on 48% of the new cases; in 1944 on 36%. Enemy activity has made follow-up and attendance irregular, but the scheme is anyhow in its infancy and no definite conclusions are claimed. Expenses from the radiological and orthodontic aspects alone are high, not to mention adequate accommodation, and salaries of social welfare and other workers; so this is an experiment not to be copied until it can be shown to give results superior to those attained by isolated consultative clinics.

ACROMIOCLAVICULAR MECHANICS

THE acromioclavicular joint is usually given a minor place in discussions of the mechanism of abduction-elevation of the shoulder; and yet its complex movements and associated ligaments are specifically related to the late evolutionary need of overcoming the weight of the suspended arm. MacConaill[1] points out that in abduction there is an increasing angle between clavicle and acromion, and an increasing gap between the root of the coracoid and the overlying clavicle. The latter separation tightens the coraco-clavicular ligament, and, since its conoid portion is attached to the posterior border of the clavicle, the clavicle is rotated backwards on its long axis and screwed home at the acromioclavicular joint. This joint, lax at rest, is now welded together after the first 20° of abduction, scapula and clavicle moving as one for the rest of the arc.



1. Acromioclavicular joint (A–Cl) and related parts from glenoid cavity. A, acromion process; B, base of spine of scapula; C, root of coracoid process; Cl, clavicle.
2. Mechanical scheme of joint under breaking stress by vertical load.
3. Showing how relative rotation of scapula and clavicle tends to bend acromion process upwards.

If the essential part of the shoulder-girdle is regarded as a hook, with the arm suspended from its crook (see figure), it is obvious that the limb tends to drag the coracoid away from the clavicle, to separate forcibly the lower part of the acromioclavicular joint, and to crush together its upper surfaces. The tension strain is met by the coracoclavicular ligament; and the compression across the upper half of the joint by the intra-articular disc which only needs to occupy this part, is much thicker above, and has its free thin lower edge at the point where compression ceases to act.

1. MacConaill, M. A. *Proc. R. Irish Acad.* 1944, **50**, 159.

These views also account for the presence of the strong coracoacromial ligament, whose fibres are arranged as if against a strain tending to separate its attachments, although they are both part of the scapula, and not at all according to its conventional function of a secondary socket for the head of the humerus. MacConaill shows that, in fact, there must be such a strain, since the screwing back of the clavicle in abduction tends to bend the acromion upwards, a movement actually occurring in the occasional cases with an acromiospinous joint; in any case there is a constant strain during the period of ossification. The ligament develops against this need, and is also accessory to the acromioclavicular joint, which can thus be more lax and mobile than it could be if such strong ligaments had to be incorporated in its own capsule. In this light, the function of the coracoid is essentially related to the mobility of the arm in man, its base held to the rotating clavicle by the conoid and trapezoid ligament, its apex to the acromion under tensile strain resisted by the coracoacromial ligament. It is not surprising therefore that it should be small or absent in mammals with much less independent shoulder range. And the arrangement is mechanically sound. The mechanical disadvantage in abduction is greatest between 20° and 90°; and the best coöperation of muscles moving the scapula with those moving the humerus is obtained by the locking of clavicle and scapula beyond the arc of 20°, when the normal swing of the hanging arm changes to powerful abduction.

PAPWORTH SURVEYED

Two questions commonly put to the doctor in charge by patients with tuberculosis—are my children specially susceptible to infection? will they run an extra risk of catching the disease from me?—are neither of them easy to answer: Infective contact (in Lyle Cummins's phrase) in the home is presumably the most important factor in the production of cases; but may not the added care given to the child's upbringing more than offset the added risk of infection? Help in answering may be expected from observations made in an institution under medical control, and Brieger has provided a masterly survey for the Papworth Settlement.[1] Of the 108 children born in the colony (apart from those of healthy staff) during the period 1922–38 none died of tuberculosis; there were a few stillbirths, some fatal accidents, and 1 death from diphtheria; otherwise the general childhood mortality was negligible. Just over half the children gave no sign—clinical or radiographic—of tuberculous infection; the remainder bore marks of surmounted primary infection, mostly in the form of calcified foci. So far so good. These children have safely survived the critical first years of life, But when the survey closed in 1938 their average age was only 5 years; many of them still have a long time to go before the critical period after puberty when reactivation is apt to occur. That, says Brieger cautiously, is for the future to reveal; MacNalty in his preface thinks it "not improbable" that their resistance to disease may continue through life. Their record indeed compares favourably with that of the other groups analysed—healthy staff and children born before admission. These are remarkable results, as MacNalty puts it, achieved by following Varrier-Jones's maxim "To prevent disease it is necessary to create an environment," of which the essentials are good feeding and avoidance of massive doses of infection. There is nothing peculiar to Papworth about the maxim or its application except the founder's flash of intuition, the fervour he transmitted to his staff, the slogging of L. B. Stott who kept the case-notes and a chronicle of all the major events in the lives

1. The Papworth Families. E. M. Brieger, MD BRESLAU, member of Papworth research staff, with a preface by Sir Arthur MacNalty, formerly CMO, Ministry of Health. Heinemann. Pp. 674. 45s.

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of the village community, and the versatility of the investigator who learned his fundamentals as head of the tuberculosis colony at Breslau and whose thoughts range far and wide over every aspect of the field. The production of the book, no mean achievement in itself, is the work of Papworth Industries under the direction of Peter Fraser.

INCIDENCE OF TRENCH FOOT

ON the Italian front the United States Fifth Army reports a gratifying reduction in the incidence of trench foot, even though the fighting has moved north to colder parts and the troops have often been immobilised in mud under driving rain, sleet, or snow in sub-freezing temperatures. During January, 1944, when the battle lines were near Cassino, the Fifth Army had 1490 cases of trench foot; this January there have been only 223. In the four months, November, 1943, to March, 1944, 23% of the army's total casualties were the result of trench foot; in the period from October, 1944, to February, 1945, the proportion had fallen to 8%, and the cases amounted to only 1·3% of the total infantry strength, compared with 4% a year before. The improvement is ascribed partly to better boots, but more to stricter discipline and unit responsibility for carrying out preventive measures.

A VASCULAR SPHINCTER

IN the fœtus two streams of blood reach the heart, from the superior and inferior venæ cavæ; and two views have been held about their behaviour. Some have believed that they mix; others that they cross one another in the right auricle, the superior caval stream proceeding to the right ventricle, and reaching the dorsal aorta by the ductus arteriosus, whereas the inferior caval stream passes through the foramen ovale to the left auricle and so to the left ventricle and aortic arch. The latter view presented the attraction that, since the inferior caval blood came largely from the placenta, the flow richest in oxygen was diverted to the head and the coronary vessels. The other view represented a revolt against it because of the apparent improbability of the two streams not getting more or less completely mixed in the right auricle.

In a book[1] just published, Barclay, Franklin, and Prichard settle this issue with a degree of finality rather rare in physiological discussions. The jumping-off point was an investigation into the time of closure of the ductus arteriosus. This was an ideal problem for solution by means of the cine-X-ray camera devised by Barclay—the only instrument in this country, and one of the very few in any country, capable of taking direct photographs. For purposes of this research Barclay stepped the speed of the camera up to three exposures a second. With the fœtus delivered, but the placental circulation intact, records of the circulation in the fœtal chest were obtained, and they are beautifully reproduced in the book. They showed that the ductus arteriosus was a sphincter and closed physiologically within 4–10 min. of ligating the cord. It appeared also that the superior caval stream did go to the right ventricle, while most, but not all, of the inferior caval stream found its way to the left auricle. This finding raised again the vexed issue of the crossing of the streams. The authors, in a new survey not only of the anatomical history but of the anatomy itself, remove the difficulty: the superior caval stream is conducted directly to the right atrium, while the inferior caval stream, on reaching the heart, breaks on a projecting ridge of tissue and is largely diverted into a funnel formed on one side by the wall of the septum and on the other by the so-called valve of the foramen ovale.

The study is completed by an investigation of the vessels leading to the fœtal heart and a satisfactory account of the ductus venosus is given.

1. The Fœtal Circulation and Cardiovascular System. By A. E. Barclay, OBE, DM, FRCP, FFR, K. J. Franklin DM, FRCP, M. M. L. Prichard, MA, all of the Nuffield Institute for Medical Research, Oxford. Blackwell. Pp. 275. 50s.

FRS

THE list of new fellows of the Royal Society, printed in our news column, contains two medical names. Dr. Leonard Colebrook, of the Medical Research Council staff, has studied chemotherapy as a bacteriologist of the St. Mary's school. He was one of the first in this country to examine, in 1936, the antibacterial action of sulphonamides, on which he writes again in our columns this week. Appointed an Army consultant in pathology at the beginning of the war, he has since taken a large share in the work of the burns units at Glasgow and more recently at Birmingham. Dr. J. H. Gaddum, professor of materia medica at Edinburgh, previously held chairs of pharmacology at Cairo, at University College, London, and at the College of the Pharmaceutical Society. He worked with Professor C. R. Harington on thyroxine, and with Sir Henry Dale on the liberation of acetylcholine at nerve-endings, and he has written on the physiological behaviour of vasodilator substances as well as the biological standardisation of neoarsphenamine. Prof. H. D. Kay, director of the National Institute for Research in Dairying, held a Beit medical fellowship and was at one time biochemist to the London Hospital. Mr. J. Z. Young, lecturer in zoology at Oxford, has been in close touch with medicine during the war as one of the Oxford team investigating regeneration of nerves. The only woman previously elected to the fellowship was Queen Victoria; and we are glad to note that two women are named among this year's fellows, one of whom, Miss Marjory Stephenson, is an authority on bacterial metabolism and a member of the scientific staff of the Medical Research Council.

TOMORROW'S BREAD

THE Ministry of Food, in collaboration with the Ministry of Health, has arranged a conference with industrial and trade organisations to advise the Ministers on future policy for flour and bread and on any regulations that may have to be made after war-time control ends. The milling and baking industries, the flour-milling trade, and the Coöperative Movement have been asked to nominate representatives. Sir Henry French, permanent secretary of the Ministry of Food, will preside, and the conference will be attended by Lord Horder, personal adviser to the Minister of Food on medical aspects of food problems, Sir Jack Drummond, FRS, the Ministry's scientific adviser, Sir Wilson Jameson, chief medical officer of the Ministry of Health, Dr. Andrew Davidson, chief medical officer of the Department of Health for Scotland, and Sir Edward Mellanby, FRS, secretary of the Medical Research Council.

The Royal College of Physicians of London, in comitia on Monday last, re-elected Lord MORAN to be their president for a further year.

Dr. HENRY MACCORMAC will deliver the Lumleian lectures at the Royal College of Physicians of London on Tuesday and Thursday, April 17 and 19, at 4.30 PM. He has chosen as his subject Prospect and Retrospect.

PENICILLIN-PHENOXETOL CREAM.—Several air-borne organisms, and particularly *Ps. pyocyanea*, produce a penicillinase which decomposes penicillin. Thus an infected penicillin cream may rapidly lose its potency and act as an infective agent. In the annual report of research done at the College of the Pharmaceutical Society, Prof. H. Berry says that a penicillin cream containing 2% of phenoxetol will keep sterile during its use in the wards, besides being effective against *Ps. pyocyanea* in wounds.

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Special Articles

DISABLEMENT AND EMPLOYMENT

R. WATSON-JONES, MCH ORTH. LPOOL, FRCS
DIRECTOR, ORTHOPÆDIC AND ACCIDENT SERVICE, LONDON HOSPITAL; CONSULTANT IN ORTHOPÆDIC SURGERY, ROYAL AIR FORCE

A DISABLED man, despite his disability, should be an asset and not a burden. When treatment is completed it is our duty to consider his ability rather than his disability. His handicap can be minimised. He can be trained and employed in almost every type of industrial and professional activity. The success with which this is achieved is one of the standards by which the civilisation of a country may be judged. On the one hand, a cripple may be a social outcast dependent upon alms; on the other, he may be restored to useful employment and full citizenship.

Much has been done in this country; but much remains to be done, and in many respects we have failed. In former years when disability resulted from war service, and the community felt an obligation to repay its debt, employers appointed unwanted commissionaires and superfluous lift-attendants. But there can be no greater degradation than to engage a man on duty which he knows to be unimportant, unnecessary, and specially prepared as a concession. The compassionate approach is misplaced; the charitable creation of artificial jobs is misguided. Moreover when disability was due to the hazards of industry, and the debt of the community was less clearly recognised, we often added to the insult of degradation the injury of financial hardship. We were content to award compensation by the payment of a few shillings each week, or to dismiss the matter once and for all by the payment of a sum in final settlement.

WHAT HAS TO BE DONE

In recent years it has been recognised more and more fully that the treatment of physical disability is not a simple problem of surgical intervention. Good surgery and good medicine may be of primary importance; but equally important are those measures of active exercise, massage, gymnastics, occupational therapy, and recreational treatment which have become known as medical rehabilitation; and of no less importance are the social services of vocational retraining and resettlement in the life of the community, which alone complete the treatment of disability. These three phases—medical treatment, rehabilitation, and resettlement—are of equal significance; and if the problems of the disabled are to be solved they must be closely coördinated.

The necessary coördination has been achieved in the orthopædic service of the Royal Air Force. The airman with multiple injuries who is treated in hospital is transferred direct to a rehabilitation centre; if necessary he is readmitted to hospital for further surgery; he is transferred once more to the rehabilitation centre where treatment is completed in the gymnasiums and playing-fields; he attends refresher courses in his former trade; if the disability is permanent he is reassessed while still in the rehabilitation centre, and arrangements are made for retraining in a new trade; if medical problems arise during retraining he goes back once more to the rehabilitation centre or to the hospital. There is absolute continuity of supervision; there is no break in the sequence; there is close coördination of surgical treatment, rehabilitation, and industrial resettlement.

That which has been achieved in one military service, and is now being attempted by the Miners' Welfare Commission in the civilian service of coalmining, and by the Birmingham Accident Hospital in the industries of that city, must be achieved in the country as a whole. Every disabled person must be treated, rehabilitated, and resettled with no interruption and no break in continuity. The surgeon who accepts responsibility for one part of the treatment must accept responsibility for the whole of it. It is no defence to urge that he is untrained as a social service worker and has no contact with industry; he might as reasonably take no part in rehabilitation because he is untrained as a masseuse, or be unwilling to perform an operation because he is untrained as an instrument-maker. He must organise surgical treatment with a team of nurses and assistants, rehabilitation with a team of physiotherapists and gymnasts, and resettlement with a team of almoners and disablement rehabilitation officers.

WHAT IS BEING DONE

The Government has given an inspiring lead in this task. It has placed upon the statute-book the Disabled Persons Employment Act. It is true that the exigencies of war made it necessary to enlist the full man-power of the nation, and that utilisation of the services of the disabled was thus encouraged. But there is a determination in the Government to create the opportunity for employment of the disabled, not because the country is in peril but because the disabled are capable and worthy of employment; there is a determination to ensure that Britain shall undertake pioneer work in rehabilitating those who suffer "a handicap in obtaining or keeping employment." An advisory council has been appointed to assist in implementing the Act, a council which includes not only employers but workers, not only doctors but disabled, a council which is already at work and is capable of great achievement. The Ministry has appointed disablement rehabilitation officers throughout the country whose duty it is to interview patients while still under treatment. They are willing and anxious to assist as soon as it is known that the disability will be permanent and that retraining may be necessary. But they cannot succeed without the sympathetic aid of medical men, and of this they are still urgently in need.

The Ministries concerned are faced with great problems. Every voluntary association which can aid in the vast programme must dedicate itself to the task. The British Council of Rehabilitation was recently formed with this purpose. It is endeavouring to secure closer coöperation between physiotherapists, occupational therapists, and educational gymnasts, and even if possible to achieve some measure of common training; it is promoting the development of hospital almoner services; it is coördinating the many schools of training for the crippled, the blind and the deaf. In the words of Lord Rushcliffe, chairman of the council: "the primary aims are to bring together workers in every field of rehabilitation . . . to become a source of information and guidance . . . to organise short-term courses of study . . . and to promote research into problems arising, more particularly those which concern the economic outlook of the permanently disabled."

"Confidence and hope do more good than physic": thus wrote Galen two centuries ago. The words apply no less forcibly today. In relieving the handicap of the disabled person our task is to complete his treatment, explain his problems, anticipate his fears and reassure his mind, to offer hope and give confidence—confidence in himself and confidence in the future. We must reestablish for him normal family life, normal employment, and normal recreation, and reinstate him in the privileges and duties of citizenship.

WOMEN MEDICAL OFFICERS IN UNITED STATES ARMY.—The office of the Surgeon-General at Washington states that 74 women medical officers are serving in the Army, of whom 4 are majors, 36 captains, and 34 first lieutenants, and 17 are serving overseas.

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HOUSING

THE Government estimate that some three-quarters of a million houses are needed if every family is to have a separate dwelling after the war. The objectives are to provide these houses, to clear slums and overcrowded areas, and to improve housing standards by a continuous programme of new building which will take account of any increase in the number of separate families, needs arising from redistribution of population, and replacement of ageing houses. These aims are beset with great difficulties, but the Minister of Reconstruction's white-paper [1] outlines a campaign for overcoming them. We give the main points.

THE EMERGENCY PERIOD

The first two years after the German war will be regarded as a period of emergency, in which the aim will be to produce the largest possible number of separate dwellings.

Increase in Building Labour Force.—Before the war there were about 1,000,000 men in the building trades. The number employed on building work at home has since shrunk to 337,000. By normal and special releases from the Forces, by training apprentices, and by a special scheme of adult training it is hoped to increase the building labour force to 800,000 by the end of the first year, and thereafter to raise it to, and beyond, the pre-war total.

Housing will have the highest priority among civil work, but the building force will also have to contribute to building for war purposes (until the defeat of Japan), building for the export trade and essential civil requirements, the rebuilding of bombed premises, and essential repairs and maintenance.

Every effort will be made to use available resources to the best advantage by the use of new methods of construction which economise in labour, by standardising, and by the use of labour and industrial capacity normally outside the building industry. A special survey is being made by the War Damage Commission of seriously damaged, unoccupiable houses, with a view to framing a programme of repair.

Permanent Houses.—The maximum target which the Government feel they can properly adopt is one of 300,000 permanent houses built or building by the end of the second year. Of this total of 300,000 there would be about 220,000 completed houses at the end of the second year, and 80,000 in varying stages of erection. If more houses can be built they will be built. Prefabrication and other non-traditional forms of construction, which make a smaller call on building labour than the traditional methods, will be used as fully as possible in the construction of permanent houses during the emergency period while building labour is scarce. Firms and local authorities are now being invited to coöperate in the erection of experimental houses, in groups of 50 or more, employing various non-traditional methods of construction. The most promising of these types will be put into large-scale production.

Local housing authorities will be encouraged to divide a proportion of the permanent houses of all types, constructed during the emergency period, into two temporarily separate dwellings (commonly known as "Duplex" flats). The programme will also include conversion of large houses and hostels into flats, and the reinstatement of derequisitioned houses which would not otherwise be fit for reoccupation as dwellings.

Temporary Houses.—The Government have been authorised to spend up to £150,000,000 on the provision of temporary houses. Temporary houses are costly because of their short lives, and they are sub-standard in terms of accommodation, though not in equipment; but they will help to bridge the gap between the programme of permanent house construction and housing needs.

The early experimental work on temporary houses was carried out in terms of a pressed-steel house, on the assumption that the manufacturing capacity would become available for this work by the end of 1944. Changes in the munitions programme postponed the date, but the Government decided in September, 1944, that a start should be made, using such materials as wood, concrete, and asbestos cement; and production is proceeding with a number of these types.

The United States government have agreed to send some 30,000 temporary houses on lend-lease terms for erection in areas of war damage, most of them to be delivered by the end of this year.

The production of temporary houses will continue long enough to meet the 145,000 allocations already made to local authorities. Production, transport, and erection of temporary houses will be undertaken by the Government on sites acquired and prepared by the local authorities, and the houses will be let and managed by the local authorities in the same way as permanent houses provided by them. Materials and fitments will be standardised as far as possible, and (as the war permits), manufacturers will be able to put these standard articles into production without waiting for specific orders.

In order to check any serious rise in building costs the Government will control the volume of contracts let by local authorities, the building and repair work done on private account, and the price of materials, standard components, and fitments. They also propose to provide subsidies for house-building both by local authorities and by private enterprise. In England and Wales they will give a subsidy in respect of privately constructed houses about the same size as those to be built by local authorities.

PRELIMINARY WORK

Over 1,500,000 of the houses damaged before the flying-bomb attacks required extensive repair, and by the middle of June, 1944, these repairs had been completed in all but 200,000 houses, many of the remainder not being worth repairing. The flying bomb created a special problem in Greater London, and efforts have been concentrated on repairing the maximum number of houses during the winter up to the minimum tolerable standard. The "winter target" of repair to 719,000 houses should now be complete.

New Construction.—In August, 1944, local authorities were invited to apply for allocations of temporary houses.

The initial allocations, made in November, 1944, amount to 86,520 in England and Wales and 33,195 in Scotland. Further allocations have since been made, and the total now amounts to 110,977 in England and Wales and 34,375 in Scotland.

The land now held by local authorities in England and Wales for permanent houses is 25,000 acres, sufficient for 250,000 houses. A further 32,000 acres (for 320,000 houses) are in process of acquisition. In addition, the Ministry of Agriculture have agreed that further sites totalling another 36,000 acres (for 360,000 houses) may be used for housing if required. In Scotland local authorities now hold 6000 acres, sufficient for 55,000 houses. A further 4000 acres are in process of acquisition. Sites for about 55,000 temporary houses have been approved in England and 28,000 acquired. The corresponding figures in Scotland are 15,000 and 8000.

Preparation of sites for permanent houses by the construction of roads and sewers is proceeding. Accepted tenders cover sites sufficient for 45,000 houses in England and Wales and 10,700 in Scotland. Detailed lay-out plans for permanent houses have been prepared for approximately 90,000 houses in England and Wales and lay-outs covering 78,000 houses have been approved. In Scotland lay-outs have been prepared for 28,000 houses, of which 23,800 have been approved.

CURRENT OPINION ON THE WHITE-PAPER

The change from pressed-steel to other types of prefabricated houses has not passed uncriticised. It is now clear that there will not be sufficient pressed steel available for this purpose before 1946, and the *Times* of March 15 comments that the new types of prefabricated house which the white-paper proposes have the same dimensions and suffer from the same siting disadvantages as the Portal house which they supersede: that is, they each need more land than a small permanent house, and they cannot be converted into permanent dwellings later. They also take some time to build; Mr. Duncan Sandys, the Minister of Works, has stated that only 3 of them, as against 10 Portal bungalows, can be put up with the building labour required for one permanent house; a *Times* correspondent (March 22) takes an even darker view: he estimates that a single bungalow requires, in all, some 1460 man-hours of traditional building labour as

1. Housing, 1945. Cmd. 6609. HMSO. 2*d*.

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against a maximum of 1000 man-hours for the complete erection of a permanent house.

A report from a committee of the Royal Institute of British Architects anticipates no lack of cement, roof tiles and felt, asphalt roofing, sanitary fittings, cookers, plumbing units, pipes and taps, or structural steel, but has grave doubts whether there will be enough baths to go round. It points out that it is necessary for the private builder to get sanction from seven separate Ministries—which some may think a good thing—and suggests the establishment of a Housing Council to coördinate the activities of regional housing councils throughout the country.

In England Now

A Running Commentary by Peripatetic Correspondents

WE who have served abroad are, it seems, "maladjusted"; we do not appreciate "the sacrifice and work" of those who have borne the war at home, who are warned that they will find us "cynical." I quote from an assortment of published remarks all dealing with this apparently difficult problem, which I have read since I came home three months ago. It is rather shaking when one feels fit and well and happy to find oneself regarded as psychopathic. I see the point, of course: there are more of them than there are of us, and the majority must be right and the minority queer.

But this "maladjustment" business is in danger of being overdone. War is much easier to bear overseas where life is wholly fantastic and specifically designed for warlike ends: in England it is much more of a strain, for it appears against the background of life as it is lived in times of peace. So the returned man finds his friends grumbling a bit about things which reveal a most surprising standard of high living—plugs that pull, lights that stay on, hot baths, beer, sheets, good feeding. If he is wise and quick, he realises how different things seem to those who have lived here all the time, and hastens to sympathise while secretly enjoying more comfort than he has known for years. If, off his guard, he forgets himself, he is labelled "cynical and unappreciative."

In fact, the people at home have had a very difficult time, have done magnificently, and are very tired. Is it just possible that we who have been abroad are, through no merit of our own, more hopeful, more stable, more sane? Might it not be a good thing if the "rather overwhelming vitality" of the returned man (I quote again) was recognised as a good thing and not as a failure to adjust to the lower level of a more tired group? To acknowledge tiredness is no crime, nor does it irritate: self-pity does.

But these are doubtless the maunderings of a returned psychopath who is taking time to settle down.

* * *

All this talk about equality of ex-Service men with civilians, whether in the matter of the chair of psychiatry or any other job, makes me and many others furious. Equality! Measured from what date? As Coventry Patmore might have written:

> And when at last he homes with doubting feet,
> uncertain how we'll greet
> the exiled man whose questing youth was spent
> in prison cage or tent,
> his tests by strain and shot
> so readily forgot,
> then brotherly, not less
> than they who for their very life would pay,
> we'll *keep* our seats and say,
> Thou must have pity on our selfishness.

Surely they who have suffered most must have every preference, not as a consolation prize, but because, other things being equal, in that they have endured they are the better.

* * *

Recent peripatetics have recounted their experiences as examiners for the MB, and have suggested that clinical nous is expected but academic abstractions are offered. The candidate might be in a better position if he could study the outlook of his future patients, and I have therefore set out below the *Students' Guide to the Layman's Idea of Medicine.*

Dermatology.—Do not waste time learning this. Skin rashes and disorders are curable: incurable as 2 : 1. Out of 3 "skins," therefore, 2 patients will accuse you (behind your back) of being the cause of all their subsequent ills by driving the rash inwardly, and the third will go to the Skin Hospital. Never put dermatitis on a panel certificate unless you really mean the industrial form. If you should put, say, "plant dermatitis" as the disease, and "from working in own garden in own time" in the "remarks" space, you will certainly lose your patient, however correct your diagnosis or skilful your treatment. That blessed word "Dermatitis" will never get past the Society's agent, who will come round and wave his little book at you, and refuse to pay out sick benefit to your patient. Dermatology is therefore a superfluous study.

Pathology.—Do not waste time learning this. Apart from the two classical malpraxes of (1) driving the rash in, (2) not driving the shock out, the following are the causes of everything:

1. *Injury:* (*a*) At work, going to work, or coming from work, or in such circumstances as will lead to "compensation"; (*b*) when travelling, and inflicted by anyone apparently richer than the patient (the motorist is fair game) (*c*) caused by the fault of the doctor or the nurse (this really means "we are such perfect people that we could not have produced a mentally defective child—the nurse was to blame in not sending for the doctor, or the doctor was to blame for putting on forceps, &c.").
2. *Neglect:* If you, or the nurse, or anyone else who can possibly be blamed, slandered, or sued, having read Cause 1, refrain from action for fear of litigation, you will be just as much blamed for "neglect." A sort of "Morton's Fork."
3. *Bad drainage:* In particular, bad smells.
4. "*Shock*": There is only one sort of shock: emotional shock.
5. *Age:* Magic changes occur at 7, 14, 21, &c.

Pathology is therefore a superfluous subject.

Neurology.—Do not waste time learning this. All lesions of CNS are due to (1) "Nerves" or "It's me noives"; or (2) "Paralysis." The cure of (1) is a permanent holiday with pay, and of (2) is massage, or preferably electricity. Neurology is therefore superfluous.

Mental Deficiency and the School Medical Service (Special Schools).—If you ever do any of this work, you will find parents always raise the defence of "we don't want our child to get like those children at the special school." The more hopeless the child, the louder the cry. Mutatis mutandis, the same arguments apply to any attempt to persuade people to enter sanatoria, &c. The public health service is really superfluous—all that is wanted is sweet drains and palatable food, and regularly emptied dustbins. The study of Public Health is therefore superfluous, apart from sanitation.

Radiology.—This is absolutely essential. On the whole, it might be worth while to try to extend the idea to embrace all the other 'otomies and 'oscopies—"eyes first and foremost." If the public exaggerate the importance of X rays the fault lies with us for misleading them. In addition to the study of Radiology, which is by no means superfluous, the student should acquire a working knowledge of (1) certification, (2) writing letters of introduction to outpatient departments, whither his patients will clamour to be sent for "proper" treatment.

Years ago my brother did my locum and summed it all up thus:

> "Will you give me a sustifickit to go upon the Panel,
> A description for some wadding and a little bit of flannel?"

Finally, remember it is your father's privilege to impoverish himself for years, and yours to spend your youth in study, to qualify as a pre-tuberculous houseman, in order to serve as a despised assistant, before loading yourself with debt, to buy a practice in a house that will warp your bride's outlook on life, so that ultimately some ignorant woman (or man) will reject you as the doctor to whom she intends to owe her bill, not because she can assess your merits but because "she heard you weren't married" or some other damnfool reason.

THE KING has given directions for the appointment of Dr. L. A. P. Slinger to the executive council of the Island of St. Lucia.

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Letters to the Editor

THE STATE AND THE CHILD

SIR,—One of the bitterest aspects of war is the relentless way in which it deprives thousands of children of their normal expectation of comfort and happiness. For the lucky ones it may be only a change of school, or less jam for tea; but upon others the breaking up of a home, the separation of parents, "shelter life," evacuation, terror, even death, have borne down with what result we shall spend the next fifty years in deciding. One can hardly pick up a newspaper without seeing bombed children in China, hungry children in India, and refugee children in Europe, gazing forlornly in passive despair at what the world is doing to them. In this country we have been spared many of these war-time evils; but we have still to contend with a system whereby children can be so badly treated in their own home that it is considered to be in their interest to remove them to another, where their fate can be even worse.

But at least it can be said that at last England is aware that all is not well, and a public inquiry into conditions, not only in remand homes but in all residential homes for children, will seek to put before the public exactly what is the position of children whom the State has to bring up as well as educate. Recent court cases present many disquieting features. It appears that the magistrates who protested against the conditions in a London remand home "exceeded their duties." Honest anger generally does exceed its duties, and those of us who have been making persistent but orderly protests for years well know the complacent indifference of public authorities. How many people have any idea of how dependent children are cared for in their own town or borough, although it is *their* rates and *their* taxes which actually foot the bill?

The public are at present indignant and sceptical as to whether the best is really being achieved. It is the "official" attitude that is so disquieting, because it seems able to ignore what might be called the human aspects of the case. A child dies, and it appears that he was beaten within a few days of his death. A little girl is neglected, and she is put in a remand home where she might have come to a different kind of harm. The law must decide who was responsible and punish them. From the human angle this matters less than that an official body should be unaware of the risks it was taking in the performance of one of its normal duties—i.e., that of caring for dependent children.

How inept to rely on any system of inspection of "Homes"! How many inspectors succeed in really knowing the children in the homes they inspect, and how many of the children come within measurable distance of knowing the inspectors? And in comparison with that confidence which is born of a real personal knowledge, how little it matters whether the sheets are clean or the lavatories well ventilated. We shall not mend matters with more and better inspectors, more and better homes; we need, first and foremost, a clear realisation that every child has the right to the sort of care that he would receive in normal circumstances in his own home from his own parents. That is his due, and he doesn't have to deserve it.

Then we must realise that if he is deprived of this, it will be a difficult job for any body of men and women, however well trained and however selflessly dedicated to their work, to provide a substitute. Therefore the men and women who are going to be foster parents, or house-mothers and teachers in residential schools, must be carefully chosen, and reasonably paid, so that their salaries compare favourably with those in other branches of the education service, and they must be properly trained in the understanding of the child's way of thinking and feeling.

A long way second comes the need for buildings which will adapt readily as homes for children. Such buildings must be workable, and they must look like a home and not a Home.

This is not asking a great deal, and now is the time when public interest is aroused and ready to be harnessed.

London. E. MILDRED CREAK.

IRON OXIDE AND THE LUNGS

SIR,—The article by McLaughlin, Grout, Barrie, and Harding (March 17) is of great interest to those of us who see workers, such as arc welders, exposed to iron fume or dust. I would suggest that the trade of shot-blasting might offer a further useful field for exploration on these lines.

Although iron oxide dust may or may not be harmless and may produce X-ray changes of no serious significance, it may (as your leading article suggests) take a generation to be sure of this point. In the meantime it is necessary to insist on the wise provision of sect. 47 of the Factories Act. This states that persons must be protected against the inhalation of dust, whether this dust be injurious or offensive or of any substantial quantity. I cannot believe that the inhalation of dusts over years—dusts which colour the sputum—can always be altogether innocuous. The amount of chronic bronchitis in large industrial centres is considerable, whether this is due to murky cities and their smoke, poor housing, working conditions, or even stuffy pubs.

In 1902 Hall, also working in Sheffield, and also dealing with crocus and rouge used in polishing of silver, noted cases of dermatitis from these substances. What irritates the skin may irritate the mucous membranes, although I agree that in many dermatitis cases the element of friction is present which would not apply to the mucous membranes.

Oxford. G. P. B. WHITWELL.

BACTERIOLOGY OF ACUTE DIARRHŒA

SIR,—In the last twelve months there has been a very large increase in the number of cases of acute diarrhœa, of varying severity, with the one common factor that pathological laboratories are unable to isolate any responsible organisms. The choice of laboratory seems quite irrelevant. I have observed this many times in recurrent cases and family infections, as well as in isolated cases, and colleagues of mine have noticed the same. I am writing to ask whether any other clinicians or pathologists have had cause to wonder at the high percentage of negative stool cultures, and whether they can suggest the reasons. I should add that in my own practice stool specimens are at once delivered to laboratories by hand.

Edgware, Middlesex. F. HARWOOD STEVENSON.

*** The age-distribution of these bacteriologically negative cases of acute diarrhœa is not given. No specific ætiological agent has yet been found for the gastro-enteritis of infancy which nowadays has no particular seasonal prevalence. In other children and adults the most common causes of acute enteritis are the dysentery bacilli, particularly the Sonne variant which is now endemic in this country, and the salmonella food-poisoning organisms. Infections due to these two groups of organism seem to be on the increase, but isolation of the pathogen from the fæces may fail if modern selective culture media are not used. Staphylococcal food-poisoning and protozoan infections should be remembered, and there may well be intestinal infections besides infantile "D and V" for which a cause has yet to be found; some of these may turn out to be due to viruses. Examination of a single sample of fæces is not enough, and specimens should be taken in the acute stage of illness. Rectal swabs, which the practitioner can easily take himself, are sometimes preferable to fæcal specimens, particularly in children.—ED. L.

REACTION AFTER PNEUMOPERITONEUM TREATMENT

SIR,—A possible, and perhaps the most likely, cause of death in the two cases reported by Aslett and Jarman (March 10) is air embolism. In the fatal case of air embolism following pneumoperitoneum treatment reported by Rilance and Warring (*Amer. Rev. Tuberc.* 1944, 44, 323) symptoms appeared four days after the last refill, and they note that symptoms may appear at the time of refill or "spontaneously." In the above two cases the onset of symptoms was 56 and 31 hours after the last refill.

Rochester. F. A. RICHARDS

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A CHAIR OF PSYCHIATRY

SIR,—Basking in reflected glory, and accepting without noticeable diffidence the lavish and undiscriminating flattery showered on all those who make a direct contribution to victory, some of our uniformed psychiatric colleagues seem to be in danger of losing their sense of proportion. In brief, they appear to have forgotten that morale—their veritable stock-in-trade—is commonly bolstered with adulation.

That some psychiatrists should develop narcissistic traits is however not surprising if we recall their sheltered institutionalised lives in times of peace, and the fact that, among the sciences, the psychiatric cult is but a parvenu enjoying a recent and immodest vogue in great affairs. Hence the paradox—the lack of insight for which many practitioners in psychology are notorious and the failure to apply the principles of their specialty to their personal adaptations.

To mitigate the anxiety, frustration, and distrust aroused in Service doctors (as reported by Brigadier James, Dr. Pearce, et al.) a little unfashionable reality-thinking is desirable; it is necessary to bear in mind that the majority of military psychiatrists are just those junior mental-hospital doctors who were most easily spared some years ago, and that, while their judgments on men and affairs have been heard with extraordinary though perhaps decreasing deference in military circles, it is by no means proved that their skill in finding the appropriate peg for the appropriate hole is any greater than that of other moderately educated observers (neutral or otherwise). It is also debatable whether they have gained any more useful psychiatric experience or competence than their civilian colleagues during the war years. Indeed it is highly improbable that a war-time mutation has rendered these junior field officers ripe for professional honours. As for their military seniors, for whom apparently Dr. Main is concerned—one can, it is true, conjure up the vision of potential professors in the jungle beating out applications for peace-time appointments on their tom-toms. But, putting this fascinating fantasy aside, it seems more likely that, wheresoever their theatre of operations, these gentlemen will be found ensconced in their club-chairs with all the resources of modern communications at their elbows.

No doubt when appointments are made, and many are seriously overdue, reasonable opportunities will be given to all suitable candidates, and all professional experience will carry due weight; but it is to be hoped that employing authorities will not give way now or later to the emotional fervour of a "khaki election" and be persuaded to exalt or promote these ancillary warriors over the heads of their civilian colleagues who, having been refused permission to join the Forces, were left, depleted in numbers and without normal opportunities of advancement, to bear, often in a very real sense, the heat and burden of battle.

Much as I should like my name to appear at the end of this letter, I must ask you to withhold it. Firstly, I belong to a public service which cannot fairly be asked to give consent (explicit or implicit) to its publication. Secondly, I have not yet given up hope of being allowed to join the Forces; and possibly the appearance of these opinions over my name would be an unfortunate prelude to a military debut.

J. M.

SIR,—Other Service correspondents, whose experience abroad in positions of professional responsibility adds weight to their views, have amply confirmed the importance of ensuring that medical officers abroad have a fair opportunity of applying for permanent medical posts at home. I do not wish, therefore, to comment further on this aspect of the letter from the London County Council in your issue of Feb. 24 except to say that it appears unnecessary for the LCC to advise the University of London on how to provide this fair opportunity. The University's reputation for a "fair field and no favour" in making its appointments is, to say the least, as good as that of the LCC. It has never made a practice of recruiting its professors entirely from its own lecturers and readers. The offering of this advice by the LCC is further evidence of that proprietary attitude towards the chair which prompted my earlier letter to you.

The latter part of the LCC's letter which sets out to remedy my "misunderstanding of how these university appointments are filled" fails to answer the points I raised. The university chair, as at present envisaged, is compounded of two ingredients. Firstly, the salaried post of director of clinical psychiatry at the Maudsley Hospital, which presumably has no duties since it has been created to enable the professor to devote his whole time to his professorial activities, and secondly, an unpaid whole-time professorship in the University of London. Which of these two ingredients is to be selected by the university committee mentioned in the LCC's letter and who are the "few LCC representatives" on this committee? Are they laymen whom the residents of Greater London have elected to their civic government? If so, what is the value of their opinion on the rival merits of aspirants to a university chair; or are they members of the LCC's medical service, who may be faced with the difficult task of weighing justly the claims of some of their own colleagues in the Council's medical service against those of "foreign" applicants. And how many are "a few"? Do their numbers equal or exceed the four university members of the committee? In any case, why are they there if the LCC does not wish to keep a string on its gift? Whose employee will the professor be? Will he be an LCC employee and thereby suffer the civil disabilities which employment by a local authority entails? Would he be able to stand for membership of the Council or of Parliament? If, like the London children's magistrates, he believed it to be his duty, would he be permitted to criticise the policy of the LCC?

It would surely be more wholesome if the LCC decided to follow the usual practice of patrons of medical education by merely endowing a chair and leaving the filling of that chair entirely to the University. I hope that the University's silence in this matter does not betoken consent already given and that there is still time for them to remember *Major Barbara* and look this Trojan gift horse in the mouth. They might still decide to retain their freedom of choice by devoting some of their newly increased Treasury grant to the payment of this professor?

SERVICE PSYCHIATRIST.

*** In reply to our request for further information, Mr. H. Claughton, principal of the University of London, informs us that in making appointments to chairs or readerships a selection committee (board of advisers) is set up consisting of the Vice-Chancellor and the Principal (who serve ex officio and are chairman and deputy chairman of the board), 3 subject experts (2 of whom are purely external and all of whom are selected by the University), and 4 representatives of the governing body of the school, appointed by the senate on the nomination of the school. Of the 9 persons, therefore, only 4 represent the school. This procedure is invariable. The board makes a recommendation to the senate, which makes the appointment on conditions previously approved by the University; but the statutes provide that the consent of the governing body of the school to the appointment shall be necessary. In conclusion, Mr. Claughton remarks: "Perhaps I might add that, on the last occasion when an appointment was made to a chair in a school governed by the LCC, the person selected had had no previous connexion with the Council."

—ED. L.

RESTAURANT HYGIENE

SIR,—There are many points which might be answered in Dr. Linfoot's letter of March 17, but the last paragraph contains a reflection on medical officers of health which was doubtless unintended but should not be allowed to pass. If there were definite evidence implicating cracked crockery as the cause of an outbreak of illness among a number of persons using a certain restaurant, medical officers of health would know about it and would take the necessary action. The fact is that such evidence does not exist at present even though more people are using cracked crockery than ever before.

Epidemiology and bacteriology are different subjects. All will agree that a pathogenic organism "may be transferred" from a cracked cup "to a healthy person," but the mere presence of a few pathogenic organisms does not necessarily foretell epidemic disease. Dr. Linfoot

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may be knocked down by a four-in-hand, but it would need a number of similar accidents before the authorities became alarmed for the safety of the public and thought it necessary to limit the number of four-in-hand vehicles in the streets. This would not mean that "the authorities had not taken the trouble to investigate," but that although they know that a four-in-hand may knock somebody down they have no evidence that the danger to the general public is very great.

Ministry of Health, London, SW1. E. L. STURDEE.

PROTEIN HYDROLYSATES IN STARVATION

SIR,—In your first leader last week you refer to the evidence that in extreme cases of starvation intravenous protein hydrolysates may save life, and you say that this form of treatment must be developed. For the last 18 months a committee of the Medical Research Council has been investigating this matter, and in view of the possible need in liberated Europe has arranged for the production of these preparations on a large scale. In the course of these investigations the different preparations, both British and American, have been tested and compared. Febrile reactions have on occasion occurred with all, but we are now receiving preparations, both British and American, which provoke fever in only a minority of patients. It would be unfair both to the British and to the other American manufacturers to imply (as your leader does) that there is only one particular preparation which can be used with safety. There are several. But all are at present in short supply.

H. P. HIMSWORTH,
Chairman, Protein Requirements Committee, Medical Research Council.

RADIO-FREQUENCY CURRENTS IN TUMOUR TREATMENT

SIR,—Further to our letter of Feb. 10 and your constructive annotation in the same issue, we note the difficulties which might be experienced in controlling the pellet temperature. In the light of recent developments on artificial radio-activity, it is understood that certain light metals, such as aluminium and magnesium, can become radio-active when bombarded with alpha-rays. In some cases this artificial radio-activity lasts for 30 minutes after removal of the exciting source. Other disintegrations have also been obtained by bombarding deuteron with gamma rays (the frequency of which is very near to that of X rays). With this in mind we would suggest that the pellet administered to the patient be of such substance that it could be radio-activated, temporarily as required. This might remove some of the difficulties anticipated in controlling the temperature of the pellet.

H. MCCORMICK.
Baldock, Herts. G. A. FORSYTHE.

Public Health

Bacillary Dysentery in Scotland

THE recorded increase in cases notified as dysentery is summarised in the accompanying table. How much of this increase is real is difficult to determine, but the following points are probably relevant:—

(1) No bacteriological confirmation is required of a practitioner before he notifies a case of dysentery. The diagnosis is a clinical one, and it is known that many patients who have been suffering from nothing more than acute non-specific diarrhœa have been notified as dysentery, especially when specific dysenteric infection has lately occurred in the area.

(2) The recovery of the specific organism from the motions has become much more reliable in true dysenteric infections, and the sensitivity of modern media is such that organisms are now being recovered from persons who are not clinically ill or only slightly affected. These are quite numerous. Bacteriological diagnosis, in fact, is now so good that it is uncovering endemic dysentery, whose presence had been suspected and partly proved for a good few years.

(3) Medical staffs of institutions in which there are groups of relatively helpless persons, such as children, mental defectives, or psychotic patients, are more aware than formerly of the possible existence of dysentery in such groups. They are, therefore, searching more carefully; and what they are seeking they are liable to find.

The number of certified deaths from dysentery has been nearly static in Scotland since the outbreak of war. What this signifies is again difficult to interpret, for many more deaths are certified as due to diarrhœa and so forth, any one of which diagnoses might have been changed to dysentery if the doctor in attendance had thought of the possibility. At the same time if the proportion of all deaths accurately certified remains constant from year to year—which is quite a likely assumption—one would expect a real increase in dysentery to be accompanied by a real increase in deaths certified from that cause.

The present high incidence of notified dysentery is complicated by the occurrence at the same time, and often in the same place, of large numbers of cases of non-specific (or possibly virus) enteritis. This latter disease does not seem to have the selective age-incidence of dysentery, nor to be so liable to get into groups of the population which require constant nursing or domestic supervision.

The incidence has been widespread in both town and countryside in Scotland. Within the last nine months a particularly large number of cases have been seen in Glasgow and Edinburgh. To some extent groups of children have been selectively affected. Food-supplies, including milk and water, have been investigated many times with negative results, and food-handlers have also been negative so far.

Period	*Notified cases*	*Certified deaths*
1931–35 (average)	389	15
1936–40 (average)	1441	36
1941	2429	48
1942	2515	56
1943	2984	47
1944	4847*	48

* Unconfirmed notifications. It is expected that the figure for accepted notifications will be somewhat lower.

The seasonal incidence has tended to change, and dysentery, which was regarded as being most prevalent in the third quarters of the year, has since the beginning of 1944 shown no special seasonal incidence. The figures have increased fairly steadily right through the period to March, 1945.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED MARCH 17

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1621; whooping-cough, 1527; diphtheria, 558; paratyphoid, 10; typhoid, 6; measles (excluding rubella), 25,266; pneumonia (primary or influenzal), 876; puerperal pyrexia, 149; cerebrospinal fever, 81; poliomyelitis, 0; polio-encephalitis, 1; encephalitis lethargica, 1; dysentery, 428; ophthalmia neonatorum, 76. No case of cholera, plague, or typhus fever was notified during the week.

The number of service and civilian sick in the Infectious Hospitals of the London County Council on March 14 was 1242. During the previous week the following cases were admitted: scarlet fever, 36; diphtheria, 23; measles, 166; whooping-cough, 21.

Deaths.—In 126 great towns there were 2 (0) deaths from an enteric fever, 2 (0) from scarlet fever, 26 (2) from measles, 10 (1) from whooping-cough, 11 (2) from diphtheria, 60 (6) from diarrhœa and enteritis under two years, and 27 (3) from influenza. The figures in parentheses are those for London itself.

Newcastle-on-Tyne reported the 2 deaths from an enteric fever. There were 11 fatal cases of diarrhœa at Birmingham. Leeds had 4 deaths from measles.

The number of stillbirths notified during the week was 227 (corresponding to a rate of 34 per thousand total births), including 23 in London.

THE annual general meeting of the Medical Superintendents Society will be held at BMA House, Tavistock Square London, WC1, on Saturday, April 21, at 2.30 PM.

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On Active Service

CASUALTIES

DIED

Lieut-Colonel WILLIAM SIMPSON, MB GLASG., RAMC
Captain DIRAMUID DECLAN O'CALLAGHAN, MRCS, RAMC

WOUNDED

Captain T. B. MCMURRAY, MB LPOOL, RAMC
Lieutenant S. THOMAS, RAMC

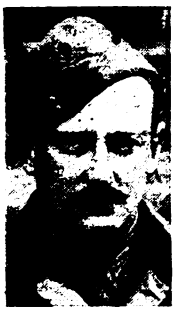
AWARDS

MC

Captain PETER DELAP, MB DUBL., RAMC
Captain L. F. MCWILLIAMS, MB BELF., RAMC

MEMOIRS

Captain R. J. FINLAY HOWE, RAMC, eldest son of Dr. and Mrs. G. H. Howe, was born at St. Leonards-on-Sea in 1913.



Educated at Epsom College and the London Hospital he qualified MRCS in December, 1939, and was called up at once. He joined the 127 Field Ambulance at Savernake Forest as lieutenant. A few months later he was drafted to France; in April he entered Belgium with the British Army, and he was evacuated through Dunkirk where he volunteered to stay behind with the wounded. He was drafted to Egypt in September, 1940, and appointed RMO to a Pioneer Corps and other units. Later he joined the 4th RHA, and in November of the following year he was wounded in Libya and taken prisoner by the Italians. He was kept at several camps in Italy, and after the armistice was moved to Germany where he became MO of his camp. He was finally moved to Stalag XVIIIA at Wolfsberg, where he was senior MO and where he was killed on Dec. 18, 1944, as a result of air action. During his three years in prison camps he was very popular with his fellow prisoners, both officers and men, and his keen sense of humour helped not only himself but them.

Captain B. A. MACLEAN BROWN, MC, RAMC, was awarded his decoration for his services during the retreat to El Alamein in 1942. Soon after his regiment arrived in the battle area at the beginning of June his armoured scout car broke down but he carried on in an unarmoured 15 cwt. truck. He was never at the unit's comparatively safe A1 vehicle echelon area, but chose to remain close behind the tanks where he could watch the battle and go immediately to their help. On July 3 the regiment was alongside an RHA battery under heavy fire and Captain Brown went right up to the guns seven or eight times and brought out 20 wounded gunners. Later when the regiment was heavily engaged by enemy tanks and anti-tank guns he twice went through a gap in the minefield which was under fire to render medical aid to the tanks. His complete disregard for his own safety in his unarmoured truck was an inspiration to the men in the tanks, who described him as "terrific."

Bee Bolton

Bernard Alfred Maclean Brown was born in 1912 the only son of Alfred V. Brown, a former judge in Malaya, and Margaret Helen Maclean. He was educated at Marlborough, St. John's College, Oxford, and University College Hospital, London, where he qualified in 1938, taking his BM Oxfd the following year. After holding house appointments at the Royal Ear Hospital and the Miller General Hospital he spent a few months in private practice in London till he joined the RAMC at the beginning of 1940. He served with the BEF in France and was attached to the force covering the evacuation from Cherbourg. After some months in Northern Ireland he was posted to the Middle East early in 1941 and the following year he was mentioned in despatches for his work with the 8th Army. He took part in the landing operations in Sicily and Italy. He was recalled to Middle East for a time but returned to Italy last August and died there on Feb. 25.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

THE House has been discussing very varied topics this week, including civil aviation, the geographical distribution of industry, and the housing problem—all matters of peace-time concern. And it has not been very happy about any of them.

The question running through all debates is as to the scale and the nature of the planning and degree of control required. The advocates of free enterprise and no controls find themselves in practice up against existing monopolies and the need of some controls for the sake of safety. And the advocates of State-directed enterprise find themselves obliged to concede that there are large spheres of economic life in which individual small management will continue, and some controls which are merely bureaucratic.

The debates showed that the transition to peace-time politics is not going to be an easy passage. The need to distribute industry over the area of the United Kingdom in such a way as to avoid the industrial slums which before the war were called depressed areas is a need which cannot be gainsaid. The Government, who have to consider the evil effects of prolonged unemployment on civilian morale, on local finances, and on the public health, are obliged to take a different view from the individual entrepreneur who is concerned with getting on with his job. The country cannot afford to have derelict areas with chronic unemployment extending over many years, as in South Wales before the war.

The most acute conflict arose in the House during the housing debate. The Prime Minister promised the country some time ago that the housing problem would be treated like a military operation. But if this is being done we are still a very long way from the housing D-day. The number of houses built during the war is the same as the number of houses completely destroyed by enemy action. And this leaves out of account the number damaged to some degree along a scale rising from slightly to very severely indeed. Repairs being done in "Southern England"—that delectable collection of cities and counties which includes London—march some way behind the urgent demand for accommodation.

Members of all parties were critical. Mr. Arthur Greenwood, speaking for Labour, described the Minister of Health's proposals as "chicken-feed for a hungry nation." An early debate on the use and control of land was asked for because without this a full and satisfactory housing programme was impossible. The Uthwatt report produced a compromise plan for the control and use of land some time ago—a compromise between the present methods and nationalisation—but this was rejected. Many members think that without Uthwatt control a real planned housing programme will be impracticable and disastrously expensive. The situation is bad enough now, because of the standstill in housing imposed by the war, and the deterioration due to lack of repair and maintenance imposed by the war, to which the blitzing of certain areas has added a further blitz deterioration. But what it will be when large numbers of men are demobilised after the defeat of Germany and wish to return to take up peace work is not pleasant to contemplate.

With all the temporary houses which it is possible to provide in the near future, and all the permanent building that can be done in the next twelve months, the housing supply will still be very very short. Mr. Greenwood described the situation as bleak and grim.

The Conservative member for North Hackney was severe on the Government; the Labour member for Bow and Bromley said that out of bad housing great social discontent would arise. Mr. Lipson, Independent Conservative for Cheltenham, thought new men and new methods were needed. Captain Cobb, who shares the representation of Preston with Major Randolph Churchill, the Prime Minister's son, plumped for a Minister of Housing who could have all the necessary powers. And this was an opinion in which a large number of workers concurred. What the House wants is one Minister, one big-scale plan, and a real drive to tackle a major defect in the peace planning.

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Housing is, however, only one of the difficulties of peace. The sudden commotion on the food front, and some incorrect publicity in the American press, made it necessary for the Prime Minister to state that our food stocks are 6 million tons only and not—as had been suggested—700 million tons. Of this 6 million tons we are sending 1¼ million to liberated Europe by June 30. We shall certainly need to continue to grow all we can in this country for some time to come. And very clearly we shall need to reinforce our civilian medical organisation as soon as we can. For insufficient housing—or in plainer language overcrowding—and a diet which, while enough in quantity, yet lacks variety, and may be relatively deficient in animal protein, will subject the health of the nation to strain. Moreover, alongside of us, in Continental Europe, there are many areas in which the conditions will be in the future, as they are now, very much worse than our own. That no world epidemic has yet raised its head is not only the kindly act of Providence, but the result of a generally better medical service in this country and in Continental Europe as a whole than we had in the years following the armistice of 1918. But it looks as if the civilian authorities in this country, particularly local-government authorities, will have to take more heed of medical knowledge in directing their administration of housing and food-rationing if we are to avoid great dangers to national health.

OUR FOOD STOCKS

Mr. CHURCHILL, in the House of Commons on March 20, said that in the earlier years of the war there was good reason, on security grounds, against disclosing our food stock figures. In view of the present military position that objection no longer held. He had read in the newspapers that there was an impression in some quarters in the United States that our stocks in Great Britain amounted to 700 million tons. Actually they were now rather less than 6 million tons and they were in process of being reduced by aid to the liberated countries to about 4,750,000 tons by the end of June. This latter figure was no more than was necessary to maintain a regular flow of distribution under present conditions. He thought it was worth while mentioning these facts about our stocks of food, which had been built up by foresight and self-denial over five years of strict rationing and frequent bombardment. The statement he had quoted did not emanate from the American government, but he thought it was a mistake to get widespread misunderstanding in these matters which were going to be settled in the most friendly and considerate manner by both sides.

Mr. RHYS DAVIES: Would my right hon. friend agree with the suggestion that so long as about half the human race continue to kill each other, and, in view of the destruction that is now proceeding, some countries may be faced with famine very shortly?—Mr. CHURCHILL: That is quite true, and large portions of Europe may be faced with varying degrees of famine—in some cases total famine—in this forthcoming winter. That is a reason for accelerating the military operations to the utmost of our intensity.

QUESTION TIME

Whiter Bread

Dr. E. SUMMERSKILL asked the Minister of Food whether the scientific advisory committee, the special diets committee of the Medical Research Council, or the nutrition committee of the Ministry of Health or his Ministry were consulted before the extraction-rate of wheat was reduced below the 1942 standard.—Colonel J. J. LLEWELLIN replied: The committee consulted was the Standing Committee on Medical and Nutritional Problems.

Dr. SUMMERSKILL: Can the Minister tell the House why the committees which were set up for the express purpose of advising the Minister on this subject were not consulted?—Colonel LLEWELLIN: The committee to advise on a subject like this is the one to which it was referred. The special diets committee only advises me on diets for invalids. The main scientific advisory committee does not consist of nutritional experts but of scientists of all kinds, while the nutritional committee of the Ministry of Health has had its place taken during the war years by the Standing Committee to which I have referred, and to which this matter was referred.

Dr. SUMMERSKILL: Were the members of the committee which the Minister consulted unanimous in their view?—Colonel LLEWELLIN: I do not think it is ever right for a minister to disclose the nature and source of advice tendered to him. The Government takes the responsibility for the decision. However, the advice given was that it would not appreciably affect the nutritional value of the loaf.

Dr. SUMMERSKILL asked the Minister (1) to what extent his expert medical advice had indicated that white bread was deficient in nutritional content and that since the introduction of the national loaf there had been a marked decrease in the incidence of anæmia and a reduction in the sale of aperients and (2) whether he was aware that owing to the less satisfying properties of white bread it was in the interests of the millers to press for the abolition of the national loaf and against the interest of those consumers who could not afford to supplement their diet with food rich in vitamins, and what further action he was taking as a result.—Colonel LLEWELLIN replied: I do not know whether the question refers to the present whiter loaf, which is mainly composed of the new national flour of 80% extraction. If it does, according to the advice given to the Government before the extraction-rate was altered, and according to the tests since taken, there is no appreciable loss in nutritional value compared with the previous loaf. The Government does not intend to reduce the extraction-rate further unless and until it is satisfied that the reduction would not be detrimental from the nutritional point of view.

Dr. SUMMERSKILL: Is the minister aware that the highest scientific authorities have advised him and his department that this action is not in the interests of the poorest section of the community, who are unable to supplement their diet with the richer food which contain proteins; and that this action is probably in the interests of the middle and the upper classes, and will be detrimental to the lower income groups?—Colonel LLEWELLIN: It is certainly not in the interests of the millers. During war-time the millers are paid a management fee, so their remuneration does not depend on how much is sold as flour and how much as feeding stuffs. In fact, if that were so, they would be getting £16 per ton for flour as against £8 12*s.* 6*d.* per ton for feeding stuffs, and if they were paid in those proportions the higher the extraction-rate of flour the more money they would be making. In regard to the distinction drawn between the richer and poorer classes of the country, the Government were satisfied, before they reduced the extraction-rate, that there was no loss of nutritional value, because in the experimental station we have found new methods so as to get the germ and the endosperm into the flour, and preserve the nutritional quality. We must really march with the times and take advantage of new scientific discoveries which come to our notice.

Mr. F. C. R. DOUGLAS: What was the nature of the tests to which the Minister referred?—Colonel LLEWELLIN: From every mill which is milling flour samples are sent to the Ministry's cereal research station. They are tested by the experts there to see how much of these different vitamins they contain—I admit I do not know how they do it but everybody says they can—and then I get the results.—Mr. W. LEACH: Will the Minister take note that most people prefer white bread, and that bakers are very sceptical of the virtues, so called, of the brown loaf?

Prof. A. V. HILL, FRS, asked the Minister how many more tons of wheat were required annually in the United Kingdom to mill flour of 80% extraction than of 85% extraction; and whether, in view of the grave shortage of food in Europe, and the admitted fact that the 80% was no more nourishing than the 85% this extra, wheat would be saved.—Colonel LLEWELLIN replied: About 325,000 tons, but thereby the same tonnage of animal feeding-stuffs is provided, an amount which would otherwise have to be imported in some form in order to maintain our essential livestock.

MEDICAL RESEARCH COUNCIL.—Mr. ATTLEE stated that during the five years 1935–39 the expenditure of the Medical Research Council was £970,364. According to the 1944–45 revised estimates, for the years 1940–44 it was £1,328,606.

PENICILLIN SUPPLIES IN BRITISH COLONIES.—Colonel STANLEY said that supplies of penicillin were now available in the Colonies from the United Kingdom, the United States of America, or Canada as is most convenient, for the treatment of all civilian cases for which penicillin is known to be effective.

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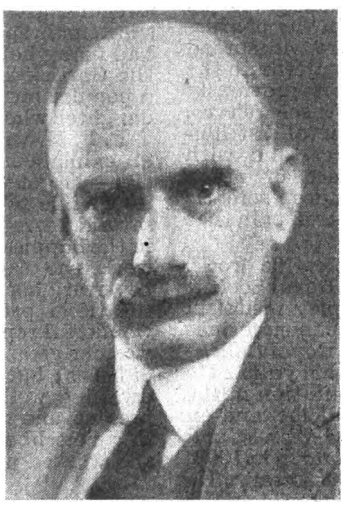
Obituary

THOMAS LEWIS

KT, CBE, MD LOND., D SC WALES, LL D, F R C P, F R S

Sir Thomas Lewis died at his home near Rickmansworth on March 17. Posterity will recognise that the peculiar importance of his life lay not in his individual scientific publications, though they were numerous and important; nor in the many monographs and excellent textbooks that he wrote; but in his being the pioneer and ultimately the leader of a movement to bring the methods of science and the critical standards of science to the bedside, to the study of disease in man. It is true that others had preceded him in this, but the efforts were sporadic; Lewis was persistent and insistent, and his work, during the long period of 36 years in which he held an international reputation, was all an illustration of this thesis; moreover, he was the first to bring, on any scale, the experimental method to the analysis of phenomena seen in the sick patient. What may less easily be recognised are the difficulties which beset such an achievement; the lure on the one hand of the social and economic rewards of consulting practice, and on the other of the well-trodden path to scientific eminence through experimental work on animals; the doubt of both his scientific and clinical contemporaries that scientific methods and standards could be profitably applied to the patient—a doubt which not infrequently blazed into open opposition.



Lewis's achievement cannot be dissociated from the circumstances surrounding his life. On the material side his career was easier because his father was a man of means; the Beit fellowships were created at a time when his work was first becoming really fruitful, and the Medical Research Committee, later the Medical Research Council, followed; his wife arranged his home to give him full opportunities for his work. On the intellectual side his environment was equally fortunate; he was house-physician to Thomas Barlow and house-surgeon to Victor Horsley; he learnt his physiology from Swale Vincent, and he began his serious scientific work in the laboratory of Starling, with Bayliss and Cushney as neighbours and friends. Finally at the age of 26 he met James Mackenzie, and the influence of their friendship was to last throughout his life. But in the final analysis his achievement was due to his own vision, courage, and tenacity, and to his mental and technical ability. Outstanding was his energy and strength of purpose; once he had decided on a course of action—and such decisions were the result of careful deliberation—he gave himself body and soul to the work until it was done; difficulties which might have dismayed a lesser man were to Lewis but calls for further exertion. He was a superb craftsman, taking the craftsman's pride in his work; despite their immense volume and variety, his writings all bear witness to the care and study given to their preparation. That his published work was so enormous—he was the author of over 230 scientific papers and 12 monographs and textbooks—and of so high a standard is eloquent testimony to his speed and capacity of execution. But there was another factor, for Lewis was discriminating in what he did: he never undertook work which was unessential to his central purpose and which he thought others could do as well as he; nor did he waste his time in work in which he did not excel. In this refusal to be sidetracked from his purpose he displayed moral courage, for it often led him to be misjudged as uncoöperative by his contemporaries.

Thomas Lewis was born in 1881, the son of a colliery-owner, Henry Lewis, of Tynant, Cardiff; he was educated at Clifton and afterwards at University College, Cardiff, where at the age of 20 he published, under Swale Vincent's direction, the first of a series of papers on the hæmolymph glands, papers which are still standard works. For his clinical work he proceeded to University College Hospital, qualifying in 1904, and winning the university medal in the MB, BS and other prizes. He was early attracted to a career in surgery; but, finding the atmosphere of the operating theatre too fatiguing, turned his attention to consulting medicine, took the MRCP in 1907, was appointed to the staff of the London Chest Hospital, Victoria Park, in 1906, and set up his plate. Here he wrote some clinical papers, but it was through physiology that he chose to make deeper studies of the problems arising out of his clinical experience, and he was soon working in Starling's laboratory on the experimental production of pleural effusions. Two papers in 1906 on the influence of respiration on the arterial and venous pulses decided his fate. For in them he criticised Leonard Hill, who, with a generosity which Lewis always remembered with gratitude, wrote to say he agreed with every word of the criticism and asked him to write a chapter on the pulse for his *Recent Advances in Physiology*. The preparation of this chapter took Lewis to Mackenzie, then newly arrived in London; the polygraph was demonstrated, and Lewis immediately became a member of that active group engaged in the analysis of irregularities of the heart.

The chief problem then engaging Mackenzie's mind was that total and persistent irregularity of the heart which he had shown was peculiar in reacting to digitalis and which, as a result of his polygraphic studies, he had attributed to nodal rhythm. But new evidence was needed, and Einthoven's new string galvanometer seemed promising. Lewis bought the new instrument at his own expense, and set it up in a cellar at University College Hospital, the only accommodation that could be provided for him. A rich harvest followed, most important the recognition in 1909, simultaneously with two Austrian workers, that the nodal rhythm of Mackenzie was really auricular fibrillation. More electrocardiographic studies led to the accurate and delicate analysis of the manner of spread of the excitation wave from the sino-auricular node over the rest of the heart. For this work, Lewis received his FRS in 1918, having been appointed assistant physician to University College Hospital in 1913.

The war of 1914–18 temporarily diverted the flow. In 1914 arrangements had almost been completed for Lewis to command a Welsh military hospital in Mesopotamia when he was invited by the Medical Research Committee to take charge of work, which was carried out first at University College, later at Mount Vernon Hospital, Hampstead, and finally at Colchester, on soldier's heart. He entered the Council's full-time service in 1916 and finally abandoned his consulting-rooms in Queen Anne Street. (He never really enjoyed consulting practice, and had been known to forget about a private patient in his rooms when he was busy with an experiment.) The work of Lewis and his team on soldier's heart—or, as it was renamed, effort syndrome—had several important consequences. It led to a critical examination of the criteria for the diagnosis of organic heart disease, afterwards of great importance in the practice of cardiology. It also led to improved methods for the selection of recruits and for the treatment of soldier's heart by graduated exercises. For this work and that for the Ministry of Pensions, Lewis was appointed CBE in 1920 and knighted in 1921.

Back in his laboratory after the war, Lewis initiated a follow-up of 1000 pensioners with organic heart disease—a work completed, with the loss of only 13 records, by Grant ten years later. He continued his electrocardiographic studies which terminated in the brilliant identification of the nature of auricular flutter and fibrillation as a circus movement of the excitatory wave around the mouths of the great veins. Weary of being tied to an elaborate instrument, he now reverted to work begun when, studying soldier's heart, he investigated dermatographia and found evidence for the independent contractility of the capillaries—a discovery which shortly preceded the similar and independent discoveries of Ebbecke, Dale and Richards, and Krogh. He began a

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series of observations, chiefly on the skin vessels, fundamental to our knowledge of vascular physiology. Chief among his discoveries was the common pattern of the reaction of the skin to injury, which he called the triple response and identified as due to the release from the injured cells of a histamine-like substance. These investigations, like all his later and unlike his earlier work, were carried out with the simplest of apparatus.

His chief interest had now moved away from electrocardiography, and his department, financed by the Medical Research Council, became the Department of Clinical Research. The methods used so profitably for the study of vascular physiology were applied to disease, and the mechanism of Raynaud's disease and of acrocyanosis soon yielded to the new attack. Work on the consequences of arrested blood-flow to the limb followed, resulting in the discovery of the differential paralysis of nerves subserving different functions. The pain of intermittent claudication was shown by his team to be due to a chemical substance released by muscular contraction, a finding which Lewis was quick to perceive also applied to angina pectoris.

This work led him to his final interest, pain. Lewis demonstrated that pain arising from skin was of one kind and differed from deep pain. He demonstrated the intervention of chemical agents, not only in the production of cutaneous pain but also of the more widespread tenderness; his experiments forced him to attribute the latter to axon reflexes through fibres not previously known, and which he named the nocifensor nerves. Work for his laboratory showed the segmental distribution of pain arising from deep structures, and with Kellgren he demonstrated the occurrence of reflex muscular contraction and tenderness from deep somatic stimuli, thus reopening the question of referred pain that had so interested Mackenzie.

Many honours went to Lewis for his scientific work. Chief among them were the awards by the Royal Society of the Royal medal in 1927, and the Copley medal in 1941, the latter being the first award to a clinician since Lister, and by the Royal Society and the Royal College of Physicians of the Conway Evans prize this year. He was unique in having an international reputation in the two spheres of physiology and clinical medicine, and on three separate topics—the heart, the blood-vessels, and pain. He was editor of *Heart* from its beginning in 1908, and of its successor *Clinical Science* until last year. He was one of the few great editors of scientific journals, for he demanded of his contributors the same high standard of precision in thought and expression which he set himself. He was a faithful servant of University College Hospital, where he taught with unfailing regularity in the wards and outpatients; and in the second year of the war he took entire charge of the first-year students during their stay at Cardiff. He was a great teacher, for his utterances were as clear and as well composed as his writings; but he was sometimes a little above the head of the average student. He was keenly interested in medical education, publishing two thoughtful articles in this journal last summer. His last book *Exercises in Human Physiology* (which is reviewed on another page) is a constructive attempt to coördinate physiological and clinical teaching.

Outside his work Sir Thomas Lewis's interests lay in his family, his friends, and the country. His hobbies were typical of the man. Until his first illness in 1926 he spent nearly all his Sundays and holidays watching and photographing birds, accumulating one of the finest collections of photographs made by an amateur. Subsequently he took up fishing, and this, with gardening in later years, again completely occupied his leisure, for he was never idle. He was of average height but broad and physically very strong and active. Most remarkable were his eyes, which were deep-set under bushy brows and of a pure blue; his gaze was intense and very keen, for he could tell a small bird from fifty yards.

He married, in 1916, Lorna, the daughter of Mr. Treharne-James of Merthyr Tydvil, and leaves a son and two daughters.

G. W. P.

A memorial service to Sir Thomas Lewis was held at St. Pancras Church, London, on Tuesday last.

GEOFFREY WILLIAMS CARTE

B M OXFD, F R C S

AT the age of 60 Mr. Geoffrey Carte died in London on March 6. He was the son of Geoffrey Williams Carte, who was a musician and was connected with the firm of Rudall Carte & Co., makers of musical instruments. He was a distant relative of the D'Oyley Carte family.

He was educated at Rugby and Oxford, and afterwards entered St. Bartholomew's Hospital, where he qualified in 1912 and was house-surgeon and later assistant in the throat department. In the last war he served with the Royal Navy and later as consultant to the Admiralty. In 1921 he became FRCS, and thereafter he held honorary appointments in the throat and ear department of the London Hospital, the Metropolitan Hospital, and St. Andrew's Hospital, Dollis Hill. During the present war he was a member of the Home Guard, and also devoted himself enthusiastically to ARP duties, in which service he was mentioned. In addition to his hospital work he carried on a very busy practice; for many years he was assistant to Sir Milsom Rees, and after the latter's retirement continued to treat many singers and actors. From his father he inherited his love of music and he was a regular attendant at Covent Garden. He was a keen sportsman, spending holidays in shooting and fishing, and had many hobbies, including gardening. His clubs were the Garrick and the Set of Odd Volumes, and he was a popular member. He was twice married and leaves a daughter who is at present serving in the WAAF.

F. F. M. writes: To know Geoffrey Carte was always an exhilarating experience, for—to use his own expression—he got "such a crack out of life" that it was almost impossible not to catch his zest and enthusiasm. For several years he worked with me at the London Hospital in the happiest of partnerships, throwing into his medical work the same keen cheerful spirit. Professionally, however, his main interest was with the singing and theatrical professions, where he deservedly enjoyed a wonderful reputation. A week-end at his Essex cottage was one great joy: he loved his garden and his collection of herbs; but he was keenest of all on his experiments in dwarfing well-known flowers, and he would frequently present one with a bunch of daffodils or other flowers in a matchbox. I have always been glad that I knew and worked with him.

HUGH MIDDLETON EYRES

M B EDIN

Dr. H. M. Eyres died on March 12, at the age of 73, at his home at Keswick, to which he retired after spending many years in practice at Richmond, Yorks. Educated at the City of London School and the University of Edinburgh, he graduated in 1895. After postgraduate study in Berlin and house-appointments at the Edinburgh Royal Infirmary and the Simpson Memorial Hospital, Edinburgh, he settled at Richmond. He was quickly recognised as a thoroughly competent doctor, and outside his busy practice he acted as honorary medical officer to the Victoria Hospital. B. C. K., a lifelong friend, writes: Eyres was a gentle, kindly urbane man, free from all snobbishness, with an abundant sense of humour and a great fund of good stories. Widely read, he had a keen appreciation of beauty in all its forms, and of him one might truly say he had "beauty in the inner soul, and the outward and inward man were at one."

THE Ling Physical Education Association is holding its Easter holiday course at St. Paul's Girls' School, Brook Green, London, W6, from Thursday, April 5, to Wednesday, April 11. The speakers will include Prof. Samson Wright, ductless glands; Mr. A. M. A. Moore, common diseases of the foot; and Miss M. Forrester-Brown, postural defects. Lectures and discussions will also be held on penicillin, rehabilitation centres, poliomyelitis, occupational therapy, remedial exercises for chest conditions, rickets, foot deformities, and re-education of patients suffering from head injuries. A school doctor, a headmistress, and a teacher of physical education will take part in a symposium on "the relation of physical education to education as a whole." Further information from the secretary, Hamilton House, Bidborough Street, WC1.

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Notes and News

A CRITIC OF ARMY MEDICAL SUPPLIES

In a paper read before the Pharmaceutical Society on March 20, Mr. W. K. Fitch, editor of the *Pharmaceutical Journal*, described his observations as a visitor to medical units on the Western Front. The packaging of drugs for the Army by some firms is, he said, a "perfect disgrace." He noted that in a light field ambulance, which must be highly mobile, "a good deal of the dispensing equipment was in wine bottles, most difficult things to pack quickly and with proper economy of space." Even allowing for war-time difficulties, the medical supply service was, he thought, far from what it should be: it enjoyed a very low priority—except, of course, in respect of such vital products as the sulphonamides, penicillin, and dressings. Relatively no progress had been made between the wars in designing equipment; nothing had been done to ensure that the Army had adequate control over its medical supplies; and no steps had been taken to prosecute a vigorous research into military pharmaceutical problems.

It will be remembered that the Pharmaceutical Society has long been pressing the War Office to improve the status of pharmacists in the Army, and take fuller advantage of their knowledge and experience. In an answer to the Society dated March 19, 1943, the War Office stated the Army Council's opinion as follows: "The arrangements for the provision and supply of drugs, dressings, and other medical supplies for the Army in all theatres of war under War Office control are in the Council's view entirely satisfactory and after 3½ years of war there has been no breakdown or criticism of these arrangements despite the extremely difficult supply and other conditions encountered" (*Lancet*, 1943, ii, 647).

MENSTRUAL TAMPONS

MANUFACTURERS report a growing demand for tampons which can be inserted into the vagina to absorb the menstrual flow, thus saving the wearer the inconvenience of wearing a sanitary pad. One brand now on the market is applied through a cardboard tube. A new brand ('Lil-lets') made by T. J. Smith & Nephew, consists of a sanitary towel of absorbent cotton-wool, covered in gauze, and compressed to tampon shape, which can be inserted manually. It is coated, the makers say, with a thin, readily-soluble and harmless film, ensuring easy insertion. They omit to state, however, whether the packs are sterilised—an important point since cotton-wool may harbour moulds.

Whether vaginal tampons of any type are altogether to be recommended is not yet clear. Experience at a family-planning clinic suggests that a fair proportion of women—those with stout vaginal mucosa and a moderate menstrual flow—find that tampons successfully prevent leakage and do not give rise to a vaginal discharge. Women with heavy periods, however, find them inadequate to absorb the flow; and a few, with thin or sensitive vaginal mucosa, state that they cause discharge and irritation. A few cases of severe mould vaginitis seem from the history to be associated with the use of vaginal tampons, and women who harbour *Trichomonas vaginalis* are nearly always made worse by their use. Virgins are not as a rule capable of using them. In view of their possible drawbacks and limited application doctors will probably hesitate to advise their wide employment. A guarantee that the tampons were sterile would go far to meet these criticisms, provided each tampon was enclosed in a suitable covering to preserve it from reinfection before use.

University of Oxford

Mr. Stanley Brookes has offered to the university an annuity of £1500 for seven years in memory of his daughter, and a Betty Brookes research fellowship is to be established for the study of problems of brain metabolism in relation to nervous and mental disease.

University of Cambridge

The General Board of the University have recommended (*Cambridge University Reporter*, March 14) that with the help of Addenbrooke's Hospital a department of experimental medicine should be set up in October under the direction of Dr. R. A. McCance, for whom a chair of experimental medicine would at the same time be created. Addenbrooke's Hospital have offered to elect Dr. McCance to their staff and to place at his disposal beds in the hospital and to meet his requirements for the nursing of his patients and the provision of special diets for them. The Medical Research Council have offered to provide the whole of Dr. McCance's salary as professor and they have already increased up to £2500 a year the grant which they are making towards his researches. The new department will be the first step in implementing the plan for a school of clinical research and post-graduate teaching which the faculty board submitted to the Goodenough Committee.

On March 17 the following degrees were conferred:

MD—H. B. May* and Emmanuel Cronin.*

M Chir.— J. M. Pullan* and D. I. Williams.*

MB, B Chir—G. N. Cooke,* H. L. English,* B. M. Heap,* and M. L. Graeme. * By proxy.

University of Dublin

On March 14 at the school of physic, Trinity College, the following degrees were conferred:

M Ch—T. L. Lawson and E. E. O'Malley.

MB, B Ch, BAO—William Burns, Isabel M. Crotty, Moira Danaher, R. M. Dooley, M. J. Doyle, Leslie Grant Duff, R. R. Hamilton, L. A. Kerwood, T. C. T. Killen, E. W. McBirney, J. D. M. Keever, Daniel O'Connell, and Kathrine B. F. Orr.

Royal College of Physicians of London

Surgeon Captain Macdonald Critchley, RNVR, will deliver the Croonian lectures at the college, Pall Mall East, SW1, on Tuesday and Thursday, May 8 and 10, at 4.30 PM. He is to speak on problems of naval warfare under climatic extremes.

Royal College of Surgeons of England

Four vacancies on the council of the college are to be filled by election on July 5. The vacancies have arisen through the death of Mr. Cecil Joll, and the retirement of Surgeon Rear-Admiral C. P. G. Wakeley, Mr. L. E. C. Norbury, and Surgeon-Captain Lambert Rogers, who are all three seeking re-election. The following other candidates have also been nominated: Mr. McNeill Love, Mr. Hamilton Bailey, Mr. Lawrence Abel, and Mr. A. Dickson Wright.

Royal Society

The following have been elected to the fellowship: LEONARD COLEBROOK, MB, member of the scientific staff of the Medical Research Council; WILLIAM SCOTT FARREN, MA, director of the Royal Aircraft Establishment, Farnborough; NORMAN FEATHER, PH D, lecturer in physics, University of Cambridge; JOHN HENRY GADDUM, SC D, MRCS, professor of pharmacology, University of Edinburgh; HARRY GODWIN, PH D, lecturer in botany, University of Cambridge; JOHN MASSON GULLAND, D SC, professor of chemistry, University of Nottingham; HILDEBRAND WOLFE HARVEY, marine biologist, Plymouth; VINCENT CHARLES ILLING, MA, professor of geology in the University of London at the Imperial College of Science and Technology; ALBERT EDWARD INGHAM, MA, lecturer in mathematics, University of Cambridge; HERBERT DAVENPORT KAY, D SC, director of the National Institute for Research in Dairying, Reading; WILFRED BENNETT LEWIS, PH D, lecturer in physics, University of Cambridge; KATHLEEN LONSDALE, physicist, Royal Institution, London; PRASANTA CHANDRA MAHALANOBIS, MA, professor of physics, Presidency College, and founder of the statistical laboratory, Calcutta; RUDOLF PEIERLS, D SC, professor of applied mathematics, University of Birmingham; JOHN MONTEITH ROBERTSON, D SC, professor of chemistry, University of Glasgow; FREDERICK MAURICE ROWE, D SC, professor of colour chemistry and dyeing, University of Leeds; Sir WILLIAM WRIGHT SMITH, MA, regius professor of botany, University of Edinburgh, and keeper of the Royal Botanic Gardens, Edinburgh; MARJORY STEPHENSON, SC D, member of the scientific staff of the Medical Research Council; BARNES NEVILLE WALLIS, B SC, mechanical engineer, chief of research and development, Vickers-Armstrong Ltd. aircraft section; and JOHN ZACHARY YOUNG, MA, lecturer in zoology, University of Oxford.

Joint Tuberculosis Council

Dr. James Watt has been re-elected chairman, Dr. D. P. Sutherland and Dr. N. Tattersall vice-chairmen, Dr. A. P. Ford hon. treasurer, and Dr. Norman England hon. secretary. Ten memoranda have been prepared for UNRRA, forming a manual for distribution to doctors and others dealing with tuberculosis in liberated countries. The Ministry of Health is to distribute 1000 copies to tuberculosis workers in Britain. Approval in principle has been given to a proposal to establish a Tuberculosis Educational Institute.

Society of Public Analysts and other Analytical Chemists

Mr. G. W. Monier-Williams, PHD, has been elected president and Mr. Lewis Eynon, FRIC, secretary, for the forthcoming year. The address of the society is 7 and 8, Idol Lane, London EC3.

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Chadwick Lecture

On Tuesday, April 10, at 2.30 PM, at 90, Buckingham Palace Road, London, SW1, Mr. A. Trystan Edwards, FRIBA, will deliver the Bossom lecture. His subject is to be sunlight and sanitation in relation to the planning of buildings.

Liverpool Psychiatric Clinic

The annual meeting of the clinic will be held at the Liverpool Town Hall on Thursday, April 12, at 3 PM, when Dr. C. H. Rogerson, director of the Cassel Hospital, will speak on the place of psychiatry in the health services of the future.

Nutrition Society

The society will hold a joint conference with the Biochemical Society on the vitamin-B complex on Saturday, April 28, at the London School of Hygiene, Keppel Street, WC1. Details of the programme will be published later. The society is also arranging a discussion on the nutritional factors affecting wound healing, to take place on Saturday, May 26, at the School.

Scottish Universities By-election

Sir John Orr, MD, FRS, director of the Rowett Institute for Animal Research, Aberdeen, is to stand as an Independent candidate at the by-election caused by the resignation of Mr. G. A. Morrison, LL D. Polling will be from April 9 to 13 and the result will probably be announced on April 14.

Health Education in Scotland

The work of the Scottish Council for Health Education, which was set up in 1943, steadily advanced last year, and 51 of the 55 major local authorities contribute to its funds. Dr. J. N. Greene Nolan has been appointed as a medical lecturer to accompany a cine-motor van on a six months' tour of the rural and highland areas, beginning early in April. Health films will be shown at each place of call and Dr. Nolan will give short talks. A summer school is to be held at St. Andrews for a fortnight from August 18, with accommodation for 180. The chairman of the council is Bailie Violet Roberton, and the offices are at 3, Castle Street, Edinburgh 2.

Royal Sanitary Institute

At a meeting to be held at 90, Buckingham Palace Road, London, SW1, on Wednesday, April 11, at 2.30 PM, Prof. S. P. Bedson, FRS, will speak on virus diseases, the mode of their spread and control.

Mrs. Churchill's Red Cross Aid to Russia Fund

As a permanent memorial to its work and as a symbol of the united sacrifices of the Soviet and British peoples this fund is to equip two 500-bed hospitals at Rostov-on-Don. After the war the hospitals will be available for the Services and civilians alike. The total cost of the hospitals will be about £400,000, and the Scottish branch of the BRCS has already sent Mrs. Churchill half this sum. Since it was started in October, 1941, the fund has raised £6,700,000, and has sent nearly 14,000 tons of drugs, hospital equipment and comforts to Russia.

Royal Society of Medicine

At the section of history of medicine on Wednesday, April 4, at 2.30 PM, Dr. Douglas Guthrie will read a paper on the patient, a neglected factor in the history of medicine. On the same day, at 5 PM, at the section of surgery, Mr. D. S. Freebody will speak on early closure of wounds, Mr. Harold Dodd on a simple method of local anæsthesia to the abdomen, and Mr. T. W. Mimpriss on retained testis. On April 5, at 5 PM, at the section of neurology, Lieut.-Colonel Ritchie Russell will discuss transient disturbance of function in gunshot wound of the head. On April 6, at the section of anæsthetics, at 2.30 PM, Dr. H. J. V. Morton is to describe the force of expiration as a sign in anæsthesia.

Poliomyelitis in United States Army

Despite the huge concentration of men from all parts of the country, and the combat conditions under which great numbers are living, the incidence of poliomyelitis in the US Army is apparently no higher than in civilian life. The number of cases was 3·4 per 100,000 troops in the United States in 1943 and 4·0 in 1944, the fatality-rate being 12·1% in 1943. This is similar to the civilian rate for similar ages, and there is a further similarity in the time of year at which the cases occurred and their geographical distribution. There has not been an epidemic of infantile paralysis at any US Army post during this war.

A Chair of Child Health at Manchester

Some two years ago the boards of management of St Mary's Hospitals for Women and Children and of the Manchester Royal Infirmary recommended the establishment of a chair of child health in Manchester. The council of the university are eager to support the project but lack the necessary funds. At a meeting of the Lancashire maternity and child-welfare authorities, reported in the *Manchester Guardian*, March 21, the delegates agreed to ask their local authorities for support. Prof. F. E. Tylecote, who took the chair, explained that the proposed department would train consultants in child health, of whom there was at present a great lack, and would also run refresher courses for doctors many of whom on demobilisation from the Forces would wish to brush up their knowledge of child health. The service and advice of the professor would be available to all hospital and contributing authorities. The university was prepared to bear the capital charge if the authorities would promise to provide the maintenance cost, £10,000 a year, for at least ten years. A further meeting is to be held in September.

LONG-ACTING INJECTIONS.—Allen & Hanburys Ltd. have introduced a series of injectable solutions of morphine hyoscine, and adrenaline in which the usual acid radical are replaced by mucate. It is claimed that combination with mucic acid will delay absorption and prolong the action of the base for 8–10 hours. 'Hyperduric MHA' contains morphine gr. ¼, hyoscine gr. 1/80, and adrenaline gr. 1/16 per c.cm.; 'Hyperduric Morphine' contains gr. ½ per c.cm.; and 'Hyperduric Adrenaline' is a 1 in 1000 solution

Appointments

BRODIE, MABEL G., MB ST. AND., DPH, DTM & H: temp. whole-time asst. MO for Islington.
CROW, K. D., MB LOND.: casualty officer, St. Mary's Hospital, London.
HAXTON, HERBERT, MB ST. AND., FRCS: surgical chief assistant at Manchester Royal Infirmary.
HIRST, KATHERINE M., MB LOND., MMSA, DPH: acting MOH for Islington (during the absence of Dr. Freeman).
JARRETT, EDWARD, MB CAMB., MRCP: medical registrar, St. Mary's Hospital, London.
MACLEAN, ARCHIBALD, MB GLASG.: examining factory surgeon for Hamilton, Lanark.
SHORVON, H. J., MRCS, DPM: war-time chief assistant, department of psychological medicine, St. Thomas's Hospital, London.
WOOD, A. B., MRCS: RSO, Dryburn Emergency Hospital, Durham

Colonial Service.—The following appointments are announced:
ARTHUR, G. D., MRCS, MO, Falkland Islands;
BILLINGTON, V. L., MB CAMB., MO, Nigeria;
FORREST, S., MB, ADMS, Tanganyika;
GREEN, G. W., MD BRUX., LRCPE, DO, MO, Nigeria;
KINNEARD, G., MD, MCPS., CPH, DMS, Fiji;
SLINGER, L. A. P., MB., senior MO, St. Lucia.

Births, Marriages, and Deaths

BIRTHS

BACKUS.—On March 20, at Birmingham, the wife of Captain A. L. Backus, RAMC—a daughter.
KENNISH.—On March 22, in London, the wife of Dr. Peter Kennish—a daughter.
KILPATRICK.—On March 20, at Northampton, the wife of Major J. A. Kilpatrick, RAMC—a daughter.
LLOYD.—On March 18, the wife of Surgeon Lieut.-Commander O. G. Lloyd, RNVR—a daughter.
REAVELL.—On March 18, at Gloucester, the wife of Dr. Denys Reavell—a son.
ULYATT.—On March 19, at Amersham, Bucks, to Dr. Frances M. Ulyatt (née Douglas), the wife of Flying-Officer Kennet Ulyatt, RAFVR—a son.

MARRIAGES

HALLETT—HAMMERSLEY-SMITH.—On March 17, in Cairo, Geoffrey Norman St. John Hallett, major RAMC, to Patricia Hammersley Smith.
ROBINSON—JOHNSON.—On Feb. 27, in London, George Albert Robinson, surgeon lieutenant RNVR, to Eunice Joy Johnson, chief officer, WRNS.
SWEET—BARNES.—On March 1, in Nairobi, Hector Struther Sweet, captain RAMC, to Audrey Elaine Barnes, VAD.

DEATHS

BALDWIN.—On March 18, Aslett Baldwin, FRCS.
RATTRAY.—On March 17, at Treharris, Glam., Alexander Mair Rattray, MD EDIN.
TAYLOR.—On March 9, at Northampton, George Lees Taylor, MD MANC., PH D, CAMB., FRCP, aged 47.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

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